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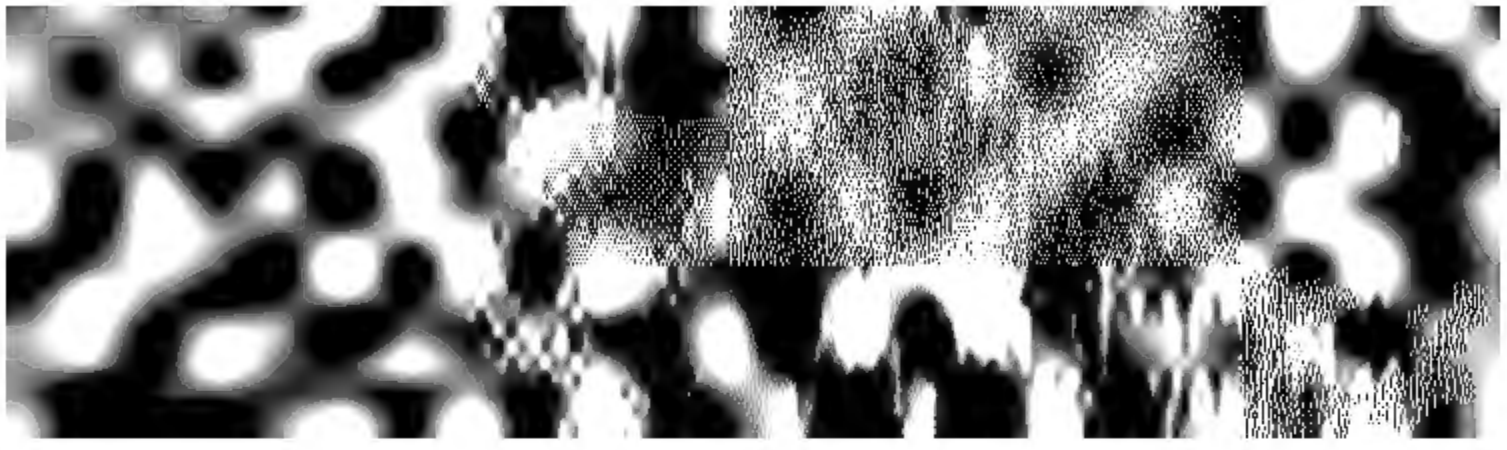
SONNENSCHEIN'S

CYCLOPÆDIA OF EDUCATION



SONNENSCHEIN'S

CYCLOPÆDIA OF EDUCATION

A HANDBOOK OF REFERENCE ON ALL SUBJECTS CONNECTED WITH EDUCATION (ITS HISTORY, THEORY, AND PRACTICE), COMPRISING ARTICLES BY EMINENT EDUCATIONAL SPECIALISTS

EDITED BY

ALFRED EWEN FLETCHER

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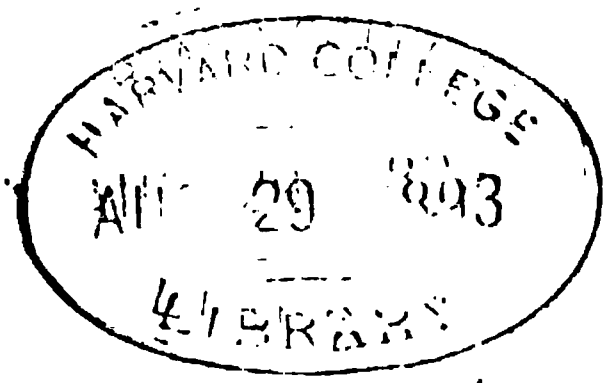

PREFACE

TO

THE FIRST EDITION.

THE OBJECT kept in view by the writers of this work has been to make it useful to all who take an interest in educational questions, and especially to those engaged in the work of teaching, whether in Elementary, Secondary, or the Higher Schools. Within the limits of a small Cyclopædia an exhaustive treatment of the great variety of subjects dealt with is not to be expected. It has therefore been the aim of the Contributors to give a telescopic rather than a microscopic view of the educational facts and questions discussed, and to bring their purely pedagogic features into clear outline.

References to authorities have been given at the conclusion of the more important articles only, as a carefully compiled Bibliography of Pedagogy is given as an Appendix to the book. The biographical section of the work does not, for obvious reasons, include notices of living persons.

A. E. F.

PREFACE

TO

THE SECOND EDITION.

THE FAVOURABLE RECEPTION which the first edition of this work has met with both in the United Kingdom and in the United States, has necessitated, within twelve months, the preparation of the present edition, which embodies the results of a careful revision. Profiting by the suggestions thrown out by the Rev. R. H. QUICK and other educational authorities who have done me the honour to criticise the book, I have made many alterations and additions, which I trust will be regarded as improvements. My thanks are specially due to the Rev. E. F. M. MACCARTHY, M.A., Miss SUSAN WOOD, B.Sc., the Rev. Dr. MOULTON, and Mr. A. H. GRANT, M.A., for valuable hints which have been of great help to me in revising the work.

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CYCLOPÆDIA OF EDUCATION.

Abacus (*ἄβαξ*, a board or slab), originally any table of rectangular form. The term was also applied to a board or table on which mathematicians drew diagrams. The abacus, as at present used to instruct children in the use of numbers, consists of a number of parallel wires on which beads are strung, the upper wire denoting units, the next tens, &c.

Abbey or Monastic Schools.—There were two kinds of schools under the direction of the monasteries: (1) schools almost exclusively devoted to the higher education of novices and those who, having completed their probation, had taken the vow; (2) schools distinct from these, in which instruction, either gratuitous or on payment, was given to children of all classes of society living in the neighbourhood of the monastery. The former were the prototypes of the collegiate schools, or colleges, which developed into the colleges at Oxford, Cambridge, and, later on, those at Winchester and Eton. From the latter sprang many of the endowed grammar schools (*q.v.*), which, at the dissolution of the monasteries, were placed in the hands of lay trustees by charter or letters patent of the Tudor sovereigns. Cathedral schools were similar to this latter kind of monastic school.

Abbreviated Longhand.—Schoolmasters do not generally encourage the practice of abbreviated longhand by their pupils, but for their own purposes teachers could save much time by adopting the abbreviations now in general use by telegraphists, journalists, and authors. Amongst the commoner of these abbreviations are *t*, the; *o*, of; *w*, with; *c^d*, could; *h*, have; *h^d*, had; *bn*, been; *f*, for; *fm*, from, *nt*, not; *t*, that; *wh*, who, which, or what; *g*, ing; *t^n*, tion or tian; *mt*, ment; *sh*, shall; *abt*, about; *circs*, circumstances; *B'm*, Birmingham; *L'pool*, Liverpool, and so on. The general rule for abbreviating longhand is to omit the vowels, except initial vowels and such as it is obviously necessary to retain to prevent confusion. *See* SHORTHAND.

Abbreviations.—The abbreviations in scholastic use are chiefly those employed to denote academic attainments, as B.A., Bachelor of Arts, M.A., Master of Arts, &c., or to facilitate the working of papers, &c., in mathematics and other studies. In university examinations candidates are generally permitted to abbreviate extensively in working geometrical papers by using signs and figures, though many teachers object to the adoption of this practice by young pupils.

A B C Method, by which children learn all the letters of the alphabet from an A B C book, from the blackboard, from cards, &c. The pupil is instructed to point to the letters singly in turn, and thus associate the form with the name. This system has now generally been superseded by the Word Method.

A B C Shooters (German *A B C Schützen*).—Jocular name for German children learning the A B C. 'Schützen' in the Middle Ages were the younger wandering scholars, who, like fags, were compelled to find food for the elder boys by begging or 'shooting,' i.e. purloining, stray fowls, &c. In German students' slang *schiessen* (shoot) still has this sense.

Abelard, Peter, *b.* at Palais, near Nantes, 1079, *d.* 1142.—He is one of the most famous of the early Scholastics, and, as the founder of conceptualism, exercised a powerful influence over mediæval thought. He was the pupil of Roscellinus and William of Champeaux. His attainments and his eloquence combined to give him an important place as an educationist. His father was wealthy, and spared no expense in his son's educa-

tion. Having learnt Hebrew, Greek, and Latin, Abelard went to the University of Paris, which enjoyed at that time a wide-spread fame. There he became the pupil of Guillaume de Champeaux, the most skilful dialectician of the age. Abelard soon surpassed his master, and often challenged him to public disputations. Abelard retired to Melun and lectured there, whither some of the Parisian students followed him. But his health gave way, although not yet twenty-two, owing to his severe studies; and for some time he sought rest. After many changes we find him again in Paris, as professor of divinity, surrounded by the most eminent scholars of his age. Here it was that he received Héloise, niece of the rich canon Fulbert, as a pupil. Her philosophic studies, however, ended in a romantic attachment that has become as celebrated in literature as that of Swift and Stella. This disturbed the rest of Abelard's life, and caused him much trouble and many enemies. In Abelard's time there were two courses of scholastic instruction: the 'trivium,' containing grammar, rhetoric, and dialectics or philosophy; the 'quadrivium,' comprising arithmetic, music, geometry, astronomy. Abelard's contemporaries agree in regarding him as an accomplished master in all these. This must be understood, of course, with regard to the age in which he lived, for it is certain that no Greek text of the writings of Aristotle existed at that time in France. Some MS. copies of his works remain, and they may be seen in the British Museum. In them and in his printed works all the quotations from Aristotle are in Latin.

Aberdeen University. *See* UNIVERSITIES.

Absenteeism. *See* ATTENDANCE.

Absent-mindedness.—This term indicates that variety of inattention which arises from mental preoccupation. This may be due to the action of some external stimulus, as when a child fails to listen to what is said to him because he is watching the movements of a fly on the window. In a special manner the term refers to the withdrawal of attention from the external surroundings as a whole, as when a child is wholly inattentive to what it sees and hears because its thoughts are absorbed in the anticipation of some treat. A bent to dreamy imagination and reverie is a common cause of absent-mindedness in children. As a source of inattention it must be carefully distinguished by the teacher from mental sluggishness, as commonly illustrated in idle wandering of the thoughts, or what Locke calls 'saundering.' As the history of more than one distinguished man tells us, absent-mindedness in relation to school lessons may be a sign of intense mental activity otherwise absorbed; and the same fact is still more strikingly illustrated in the habitual abstraction of the student from his surroundings. Absent-mindedness finds its proper remedy in the habitual awakening of the child's interest in his surroundings, in the careful training of the observing faculty and the practical aptitudes, and in the investing of subjects of instruction with all possible attractiveness. *See* ATTENTION.

Abstract and Concrete.—These refer to a fundamental distinction in our knowledge. We may have a knowledge of some particular thing in its completeness, as, for example, of water as something at once fluid, transparent, &c. This is knowledge of things in the concrete. On the other hand, we may think about the property fluidity apart from water and all other particular substances. This knowledge of qualities, as distinct from concrete things as wholes, is said to be knowledge of the abstract. In Logic all names of things, whether general or singular, are called concrete terms, all names of qualities abstract terms. It is evident from this definition that the region of abstract knowledge is that with which science is specially concerned; for all science deals with the common qualities or properties of things, such as form, chemical qualities, &c., and the general laws which govern these. It is a fundamental maxim of modern education that concrete knowledge must precede abstract. Before a child can gain any abstract ideas, as those of number, force, moral courage, some knowledge of concrete examples is indispensable. Hence it follows that subjects which deal largely with the concrete, as descriptive geography, narrative history, &c., should form the first part of the curriculum. A concrete presentation of the more striking facts of physical science by means of object lessons, supplemented by description, is the natural introduction to the more abstract consideration of its laws. (On the transition from concrete to abstract *see* Herbert

Spencer, *Education*, chap. ii.; Bain, *Education as Science*, chap. vii.)

Abstraction.—In its widest scope this term means the withdrawal of the mind from one object or feature of an object in order to fix it on another. It is in this sense the necessary accompaniment of all concentration. In a more special sense it refers to the turning away of the thoughts from the differences among individual things so as to fix them on the points of similarity. It is thus the operation which immediately leads to a knowledge of the common qualities of things, i.e. to abstract knowledge. Thus, in order to gain a clear idea of roundness, the child has to compare a number of round things, as a ball, a marble, an orange, &c., and *abstract* from the other and distinguishing features of each, as the colour of the orange. Abstraction of a greater or less degree of difficulty is always involved in classification or generalisation, i.e. the process by which the mind forms the notion of a general class, as animal, toy, &c. It also enters as the main ingredient into induction, i.e. the operation by which the mind passes from a consideration of particular facts to that of the general law which they obey. Since in all cases abstraction is a casting aside or putting out of sight of much that is present to the mind, it calls for an effort of will. Hence the difficulty attending the study of all generalities and abstract subjects in the case of young children. The more numerous and striking the points of diversity, and the more subtle and obscure the points of similarity, the greater the effort of abstraction required. The faculty of abstraction, though appearing in a crude form in young children, is the last to reach its full development. The higher abstractions, as those of mathematics, physical science, grammar, &c., should only be introduced in the later stages of education. The natural repugnance of the child to abstraction must be met by a careful process of preparation. This includes the accumulation of a sufficient quantity of concrete knowledge, a judicious selection of examples under each head, and a gradual transition from exercises of an easy character performed on sensible qualities, as weight, figure, &c., to those of a more difficult order dealing with recondite qualities. (*See* Sully, *The Teacher's Handbook of Psychology*, chaps. xii. and xiii.)

Abstract Science.—All science, as general knowledge of things, i.e. of things so far as they have common qualities, is abstract knowledge. At the same time a certain group of the sciences are marked off as Abstract and another group as Concrete. The former deal with a few properties common to a wide variety of things. Thus mathematics, the best type of an abstract science, deals with the most general aspect of things, viz. quantity; for all objects, of whatever nature they may be, exhibit the attribute of quantity. On the other hand, the sciences of description and classification, as botany, deal with the many common qualities or characters of a comparatively restricted region of phenomena. Hence they are called Concrete. In many cases we are able to distinguish an abstract or theoretical and a concrete branch of the same subject. Thus in mechanics we have a theoretical department dealing with the universal laws of equilibrium and motion, and concrete applications of these to particular forms and combinations of matter, as hydrostatics. The distinction between Abstract and Concrete science has an important bearing on the order in which the sciences should be studied. The Abstract sciences, being relatively simple and fundamental, should precede the corresponding Concrete sciences. Thus a certain knowledge of mathematics is necessary to the study of physics, chemistry, &c. (*See* Bain, *Logic*, Deduction, Introduction, and H. Spencer, *Education*, chap. i.)

Academy (Gr. Ἀκαδημία).—A recreation ground at Athens, believed to have been named after Academus, an Athenian hero of the time of the Trojan expedition. The Academia was the favourite resort of Plato. Here he used to lecture to his pupils and followers; hence his school of philosophy was called the Academic School. After the revival of letters the term Academy came to be applied to the higher schools of instruction, particularly to such as were of a unique and special character, as the academies of music, fine arts, the naval and military academies, &c. In England the application of the word has been considerably extended and appropriated as the appellation of schools of various grades. A similar abuse of the term is also common in the United States. In France, however, as in Russia, Sweden, and other European countries, the use of

the term is now almost confined to the learned societies for the advancement of literature, science, and art. The *Académie française* is the final court of appeal on questions relating to French philology, grammar, &c. The *Académie des inscriptions et belles-lettres* is another famous association of French *savants*. The desirableness of establishing an English academy of learned men having the authority of the *Académie française* has been ably advocated by Mr. Matthew Arnold and others.

Accidence. *See* GRAMMAR.

Accidents. *See* SCHOOL SURGERY.

Accomplishments.—This term refers to that part of the education of girls (*q.v.*) which includes instruction in those arts which for the most part are ornamental. Accomplishments include drawing and painting of a mildly artistic kind, dancing, and that kind of music which finds favour in drawing-rooms. Locke attached great importance to dancing as a necessary accomplishment even for a gentleman, but objected to painting on the ground that 'ill painting is one of the worst things in the world, and to attain a tolerable degree of skill in it requires too much of a man's time.' *See* ÆSTHETIC CULTURE.

Acoustics.—The subject of sound has two branches—one purely observational and concerned with the vibrations of air or of liquids and solids of such a nature as to stimulate the sense of hearing. These vibrations are different from those which excite the sense of sight, inasmuch as they are longitudinal and not transversal; that is, they consist of condensations and rarefactions in the direction in which the sound travels, not, as in the case of light of vibrations, at right angles to the direction in which the disturbance is propagated. The other branch of acoustics consists in a study of the means by which it produces sensation in the brain, and the physical conditions under which those sensations are estimated as pleasurable or painful. All substances are more or less elastic. When a portion of an elastic medium is compressed it tends to expand again, and having expanded it passes through the normal condition to a condition of rarefaction, and before it comes to its original condition it passes through many such phases. Thus any violent disturbance of the air produces an alternate condensation and rarefaction called a wave, and this repeats itself indefinitely, spreading out into all the surrounding air, like the ripples on a smooth lake from a stone which is thrown in. The rate at which this disturbance travels is in air about 1,090 feet a second. The distance which a complete wave occupies varies. The central c of the piano is a recurrent wave whose length is about $4\frac{1}{2}$ feet. Hence the number of waves which fall on the ear in a second can be calculated. If each takes up $4\frac{1}{8}$ feet and there are enough of them in a second to cover 1,090 feet, then we approximately find the number by dividing 1,090 by $4\frac{1}{8}$, which gives us 264. The standard number of vibrations for the central c has altered in recent times owing to a change in the standard of pitch. It is now exactly 264 vibrations in a second. Any concussion or rapid disturbance leads to the formation of waves in the air or in any medium. These waves are not in general musical notes. For the production of the latter regularly recurrant disturbances are necessary, and ordinary noises consist of an indefinite number of musical notes so mingled together that their separate existences are undiscernible. The chief modes of producing musical sounds are by the vibration of a string, of a membrane, and of a thin tongue of metal in a current of air. The power of the note produced is much intensified by a resounding board or a closed mass of air of such dimensions as to vibrate naturally in accord with the note produced. Thus in an organ the sound is produced by an insignificant tongue of metal, which vibrates with a multitude of notes. The organ-pipe takes up that one which it is adapted for, and is the cause of the whole volume of sound. If vibrations exceed a certain number in a second they pass beyond the limits of audibility. This varies with different persons. Some can hear the cry of a bat; it is too shrill for others to discern. A whistle has been designed by Mr. Galton in which the rate of vibration can be gradually altered, and a note is produced which, gradually becoming shriller, passes beyond the hearing first of one then of another of a company who listen to it. When it is inaudible to any one it will still influence a sensitive flame. Similarly vibrations pass below the limits of audibility when they become slower than a certain rate.

A most instructive experiment, which

illustrates many facts of optics as well as of acoustics, is the following: We take two tuning-forks of different periods of vibration. Two small beads are hung by a thread so that one just touches the prong of each fork. A third tuning-fork is now sounded which is of the same period of vibration as one of the forks. The bead in proximity to that fork will be thrown to and fro, while the bead touching the other tuning-fork will remain at rest. This shows that the tuning-fork will take up from the air the vibration which it itself will give out, and the solid mass of steel will be set in motion by the extremely minute influences of the waves of air. The same effect is produced with strings when stretched to various degrees of tension. Let us imagine a room to be completely filled with strings of one length and one degree of tension, such that they would all give out the same note. Let then a set of musical notes traverse the room, consisting of the note to which the strings are attuned and others as well. That note will set all the strings in vibration, and as a consequence it will itself be absorbed—it will not pass through the room, while the other notes will pass on, not being taken up in producing an effect in the room. Here the room full of strings is of the nature of a substance which absorbs that kind of vibration which it, when itself set in vibration, would give out. There are many instances of an action of this kind in heat and light, and the whole study of spectrum analysis rests upon a similar phenomenon in the case of light.

The vibrations of the air are conveyed to the brain by a delicate apparatus, consisting of the following parts: A membrane which is agitated by the waves passing down the passage of the ear. To this membrane are attached two bones forming a lever and conveying the vibrations to another membrane. This latter membrane encloses a space filled with fluid, the vestibule, and from this space open out two spiral-formed canals and a space shaped like a snail-shell, the cochlea. Into the fluid of the cochlea project a number of small fibres or rods of varying lengths, and it is supposed that vibrations of varying rates are picked out by these fibres, each fibre being set in vibration by its corresponding vibration, and conveyed by them to the auditory nerve. Although in the air the multitudinous vibrations of a piece of music are compounded into a single complex agitation, still the ear has the power of picking out each note, and even the particular kind of note of every instrument—that is to say, there is the power in the ear of distinguishing the several vibrations, however compounded. The state of the air through which a number of musical notes is passing is very complicated. We will consider two instances. Take the note c and the c above it. When the note c sounds, the air has its point of greatest compression and greatest rarefaction at distances of 4 feet from each other. Due to the higher c there are compressions and rarefactions at distances of 2 feet from each other. These will combine into a series at a distance of 2 feet, but these compressions and rarefactions will not be identical; where the phases of the two notes coincide there will be a more marked effect than where they differ. Still the total series will be regular, and its phases will recur, complicated as they are, within a short interval. If two notes, however, be sounded together, the periods of which differ but slightly, they will, if started in corresponding phases at one time, augment each other considerably, but after a certain time, when the faster wave has gained sufficiently on the slower wave, they will almost neutralise each other. Hence, the sound will rise and fall in intensity at appreciable intervals, giving rise to an effect similar to that of the flickering of a candle. This is productive of an unpleasant sensation to the ear, and it is found that what are called disharmonies in music are notes related in the above fashion to each other. For the experimental and general knowledge of acoustics Tyndall's book on Sound may be consulted. Airy's and Donkin's books give the more mathematical treatment. Helmholtz's book on the Sensations of Tone has been translated, and is the authority on the phenomena of sound in relation to the sense of hearing.

Acquisition of Knowledge, or learning in its widest signification, includes every operation by which the mind comes into possession of a new fact or truth. This may take place either by means of a new personal observation, through the instruction of others, or finally as the result of reflection and reasoning upon what is

already known. In the narrower and scholastic sense it refers to the gaining of knowledge by the help of others' instruction. Hence the acquisition of knowledge is sometimes distinguished from the child's independent discovery of it. Learning is often spoken of as if it were a mere exertion of the faculty of memory. But wherever new *knowledge* is gained there is a preliminary process of comprehending or assimilating the new materials. Thus in grasping a new fact in geography or natural history, a child's mind must put forth activity in first analysing or resolving the complex whole into its parts or elements, and then synthetically recombining these, and viewing them in their proper relation one to another. Not only so, the new fact presented can only be grasped or realised by the mind by the aid of its points of affinity with what is already known. In other words, the mind has to assimilate the new to the old. In the case of learning new concrete facts by verbal description, this assimilative process assumes the form of constructing a new pictorial representation out of materials supplied by the reproductive faculty. (*See* IMAGINATION.) Where the new fact is not only imaginatively realised, but also understood, the process of assimilation includes the reference of it to some previously known class, and to some familiar principle or rule. It is thus evident that learning is never a purely passive process of reception, but always involves the activity of the child's own mind. There is no gaining of knowledge where there is not close attention and a serious effort to take apart and recombine the materials presented by the teacher. (*See* K. A. Schmid's *Encyclopädie des gesammt. Erziehungs- und Unterrichtswesen*, article 'Lehren und Lernen.')

Acroamatic Method (*ἀκροαματικός*, to be heard), a term applied to the oral method of instruction adopted by Aristotle.

Activity.—By the activity of a thing is meant the putting forth of its specific and characteristic force. In a wide sense nature as a whole is constantly active, and this activity is a special characteristic of living things. In the human being we have both a physical or bodily and a mental activity. Children, like young animals, exhibit a marked tendency to spontaneous muscular action, as may be seen in their play (*see* PLAY). This instinctive impulse to muscular exertion is an important condition of the growth of the bodily powers, and of the acquisition of the command of the organs of movement by the will (*see* WILL). Mental activity, as distinguished from bodily, is the conscious exercise of mental power. The most general name for this is Attention (which *see*). It is now generally admitted that all mental development is the result of the child's self-activity. A child learns just in proportion to the degree in which it actively exerts its intellectual faculties. This mental activity is in the earlier stages of development closely connected with bodily. It is by using the organs of sense in observation and by experimenting with the moving organs, more especially the hands, that the child's intelligence is called into play. Hence the educational significance of the child's spontaneous tendency to movement, a significance which Froebel was the first to fully see and utilise. The higher form of mental activity shows itself in the voluntary concentration of attention in reproducing former impressions, and in separating and recombining these so as to carry out the operations of imagination and thought. This so-called intellectual activity is immediately dependent on an exertion of will, and hence may be said to contain a moral ingredient. At the same time it is customary to distinguish from this intellectual a moral activity, which shows itself in an effort of will to do what is right. Such exertion is the proper means by which the will is strengthened and character formed (*see* CHARACTER). Thus we see that the child's physical, intellectual, and moral development alike depend on its self-activity. (*See* K. A. Schmid's *Encyclopädie*, article 'Thätigkeitstrieb.')

Adam, Alexander, a celebrated Scottish teacher, born in Morayshire in 1741. In 1769 he succeeded to the rectorship of the High School of Edinburgh, where he distinguished himself by introducing the study of classical geography and history, and by teaching his pupils the dead languages by aid of their native tongue, a method which he probably borrowed from the Port-Royalists (*q. v.*). Adam published the first Latin grammar written in English. Previous to him the whole of the text of grammars was written in

Latin. His innovation was condemned by many, but soon became popular, and edition after edition of his grammar appeared with great rapidity. He was also the founder of the first organisation of Scottish tutors for mutual benefit. He died 1809.

Adelaide University. *See* UNIVERSITIES.

Administration. *See* EDUCATION DEPARTMENT.

Adult Education.—The promoters of the various systems of adult education contend, in the first place, that the instruction received in the day school ought to be continued, or that much of the advantage will be lost; in the second place, that some provision should be made for adults to spend their leisure time in a manner at once enjoyable and profitable. The interests of commerce have led to the establishment of technical schools, the main object of which is to make the workman more intelligent and skilful. In this general activity higher education has not been forgotten, and adults of industry and ability have abundant opportunities at different colleges and schools of studying a university course. The most important institutions founded for the promotion of adult education are: 1. *Mechanics' Institutes*, initiated by Dr. Birkbeck (*q. v.*), who delivered a course of free lectures to artisans at Glasgow in 1800. The first institute was established in London in 1823, and since that time they have spread throughout the length and breadth of the country. The premises usually include a reading-room, circulating library, lecture-room, and class-rooms. Although originally intended to be self-supporting, the subscriptions of the members are generally supplemented by contributions. 2. *Night Schools*, in connection with the different elementary schools of the country, are found in nearly every town. They are taught by certificated teachers, and supported by the fees of pupils, and by grants upon examination by the Education Department. The subjects of instruction include the 'three Rs,' geography, grammar, French, &c., as specified by the Code. 3. *Evening Classes.*—In London, at University College, King's College, the City of London College, Birkbeck Institutes, Polytechnic (Regent Street), South Kensington Museum, Finsbury Technical College, &c., evening classes are held. In the provincial colleges (*q.v.*) evening classes constitute an important part of the curriculum. A great impetus was given to adult education by the revival of the non-collegiate system at Oxford and Cambridge, and the establishment of London University, for the purpose of examining and conferring degrees. Durham and Dublin also examine candidates without residence, and so stimulate private study. 4. *Recreative Evening Classes.*—The most recent scheme for promoting adult education has been the establishment of recreative evening classes. Among the founders are eminent educationists, and many representative working men. They allege that previous efforts have been unsatisfactory because the programmes have not been sufficiently entertaining. Their aim is to provide wholesome amusement and technical instruction for young men and boys who have left school. The distinguishing features are modelling in clay, wood-carving, calisthenic exercises with dumb bells or wands to a musical accompaniment, and instruction in instrumental as well as vocal music.

Ægrotat.— When a candidate for honours in any school at Oxford, or tripos at Cambridge, is prevented by illness from taking his examination or any part of it, the examiners may grant him what is called an ægrotat degree. (Lat. *æger*, sick.)

Æsthetic Culture.—This concerns itself with the strengthening and developing of the æsthetic feelings and judgment, which together constitute what is known as taste This faculty includes the capability of recognising and enjoying all manifestations of the beautiful, both in nature and in art. It stands on the one side in close relation to the two higher senses, hearing and sight. The most rudimentary form of taste shows itself as a refined sensibility to the impressions of colour and tone. A fondness for bright colours and the combinations of these is observable, not only among young children and backward races, but even among some of the lower animals. In its fuller development taste involves the activity of the higher intellectual faculties, and more particularly the imagination (*q.v.*). This applies even to the appreciation of the sights and sounds of nature, which, as Alison has shown, owe much of their beauty and charm to suggestion. In the case of certain arts, as painting and, preeminently, literature, the exercise of the

imagination is the chief source of the æsthetic delight. The education of taste aims at expanding and refining the æsthetic feelings, and guiding the judgment by providing a fixed standard. It is thus at once a development of emotional sensibility and of intellectual power. In order to develop a child's taste it is necessary to awaken a genuine feeling for what is pretty, graceful, pathetic, sublime, &c. Hence the educator must be on his guard against the mere affectation (*q.v.*) of others' æsthetic sentiments and a mechanical reproduction of their maxims. This evil may be most effectually prevented by carefully attending to the way in which taste naturally develops, by not forcing a mature standard on the unformed childish mind, and by allowing, and even encouraging, a certain degree of individuality in taste. The education of taste includes first of all the exercise of the faculty in distinguishing and appreciating the beauties of our natural surroundings. This branch connects itself with the training of the observing faculties, and the fostering of a love of nature. Another branch concerns itself with the perception of what is graceful, noble, and so forth, in human action. And here the cultivation of taste becomes in a measure ancillary to moral education. Finally, it embraces special technical training in the fine arts, more particularly music, drawing and painting, and literary composition. Here the object of the educator must be both to form the taste by the presentation of good models, and also to exercise the child in the necessary processes of interpretative rendering, as in singing and recitation, imitative reproduction, as in drawing, and original invention. The value of a wide æsthetic culture depends on the fact that it necessarily involves an harmonious development of the feelings as a whole, and so a preparation of the child for the most varied and refined enjoyments, and also a considerable growth of the intellectual faculties. Indeed, the æsthetic feelings form one important source of interest in most, if not all, branches of study. Thus the scientific observation of nature is sustained by a feeling for its picturesque and sublime aspects, and the pursuit of history is commonly inspired by an exceptional susceptibility to the dramatic side of human life. The connection between æsthetic and intellectual education becomes especially apparent in the study of literature, which is at once as a record of thought in words, an appeal to the logical faculty, and as a variety of art embodying worthy and noble ideas in a fitting harmonious form, a stimulus to the æsthetic feelings and the critical judgment. The connection between æsthetic culture and moral training is a question that has been much discussed both in ancient and in modern writings. (*See* Sully, *Teacher's Handbook*, chap. xviii., and the references there appended; also Schmid's *Encyclopädie*, article 'Aesthetische Bildung.')

Affectation.—This refers to the assumption of the external marks of a worthy feeling as the result of a voluntary effort, and not as the spontaneous manifestation of the feeling itself. It by no means necessarily involves a deliberate intention to deceive another, as hypocrisy always does, and commonly falls short of deception as an 'awkward and forced imitation of what should be genuine and easy' (Locke). It generally implies an intensified form of self-consciousness. As a form of insincerity, and having one of its chief roots in vanity, it calls for careful watching on the part of the educator. At the same time it must be remembered that it often arises half-consciously from the wish to please and the desire to be in sympathy with others. According to Locke affectation is not the product of untaught nature, but grows up in connection with management and instruction. It is thus a failing which a careless mode of education is exceedingly likely to encourage, as where a teacher looks for and even exacts the responsive manifestation of feelings which belong to a later stage of development, such as the more refined forms of æsthetic and moral feeling. (*See* Locke, *Thoughts concerning Education*, § 66, and Miss Edgeworth, *Practical Education*, chap. x.).

Affection.—This term, once used for all permanent and constant, as distinguished from transitory and variable, states of feeling, has come to be narrowed down to one specific variety of these, viz. a feeling of attachment to others. It includes two elements which it is important to distinguish: a pleasurable feeling of tenderness showing itself in a liking for some particular person, and an element of sympathy or kindly sentiment. A true

affection is a gradual attainment involving fixed relations of a happy kind, an accumulation of memories, and a final process of reflection. Hence it has been said that grateful affection for a parent or a teacher is one of the latest of attainments. The fact that a feeling of affection prompts the subject of it to seek to please and further the happiness of the beloved object gives it a peculiar educational value. It is now commonly held that the most effectual way to influence a child is to attach it by bonds of affection. This work, which varies in difficulty according to the natural disposition of the child, is always much easier in the case of a parent than of a school teacher, for the latter, as the representative of a government which is wont to appear unnatural and excessive, is apt to arouse hostile feelings. These difficulties can only be got over by an habitual manifestation of kindness, consideration, and sympathy on the part of the teacher. *See* SYMPATHY.

Age in Education.—The connection between age and education has been the subject of much controversy, but, speaking of the period up to manhood, it has been generally agreed that there are three distinct stages in the development of the mind corresponding to three clearly marked periods in the development of the body. The three epochs extend each over seven years, and are strikingly distinguished by physiological differences in the constitution, some of which are external and obvious. These periods are infancy, childhood, and youth.

Infancy, which covers the first seven years of life, is the time of active physical development and of rapid growth. Its close is indicated by the shedding of the temporary teeth and the appearance of the earliest permanent teeth. Even during the last two or three years of this stage a child is capable of little original effort, and there are few manifestations of mental activity beyond observation and memory. Instruction during this period should hold, therefore, only a secondary place, and the education should be rather that of the body than that of the mind. The voice of nature should rule, and it demands considerable freedom from restraint, exercise for the body, and for the intellect entertainment and amusement which are not too exciting. In the application of this principle there is, however, much preparatory work to be done which will greatly facilitate future progress. The child must be brought under training and taught obedience by being induced to rely upon the teacher, and so to submit to his guidance. Advantage should be taken, too, of the great interest which is natural to children in the objects of everyday life, especially animals. Simple descriptions of the food we eat and of domestic animals afford infinite pleasure to the young, stimulate observation, furnish the mind with useful facts, and strengthen the memory. The power of imitation is strong at this age, and drawing or writing may be a source of both pleasure and profit. Reading and arithmetic are usually regarded as tasks, and only the very rudiments should be attempted. A remarkable transformation has taken place in the infants' schools of this country by the almost universal adoption of the Kindergarten method (*q.v.*) of teaching, founded by Froebel. Its general aim is to amuse the child in such a way as to exercise its faculties so that it may be educated without being conscious of pressure. The gratifying results which are obtained by this system prove the excellence of the methods employed.

Childhood extends from the seventh to the fourteenth year, or the attainment of puberty, and coincides nearly with the second dentition. Throughout this period the desire for more vigorous physical exercise is manifested. The child begins to feel his strength, and gives evidence of his power and tastes by independent thought and action, which point to a future career. Natural propensities are now quickly developed, impressions are received and character formed. The desires and aspirations should be carefully observed by the teacher so as to approve and encourage what is good, or to restrain and check the evil.

Youth embraces the period from fourteen to twenty-one years of age, during which the development of the body is completed, and virility is attained. This is essentially the time of special preparation for the battle of life. Except in the case of the wealthy and those intending to adopt a profession, the opportunity of giving undivided energy to study has ended with boyhood. The faculties of the mind are now active and vigorous, the imagi-

nation is quickened, and a youth should enter upon the study of his favourite subject full of hope and zeal. To ensure sound progress and to prepare for responsibility which is near at hand, the teacher, while he still carefully guides, should provide less assistance and require greater independent exertion and original effort on the part of the pupil.

Legislation in reference to age and education varies in different countries, and even in different parts of the same country. In England, school boards and school attendance committees may compel attendance at school under the Elementary Education Act from five to fourteen years of age. Between these limits the years of school attendance required by the bye-laws of different school boards and committees vary considerably. As a rule the period of attendance is shorter in agricultural districts than in towns, numbers of children in rural parishes being allowed to leave school at ten years of age, provided they have passed the fourth standard.

The School Board for London compels attendance from five years of age until either (1) the sixth standard is passed; or (2) the child is thirteen years of age and has passed the fourth standard; or (3) the child is fourteen years of age. In the United States the legal school age is from five to fifteen; in France from seven to twelve; in Germany from six to fourteen. In Switzerland each canton legislates for itself. In Lucerne attendance at day school is compulsory from seven to fourteen years, followed by two years at an evening school. In Zurich the age is from six to twelve at day school, and three years at an evening school.

Agents — Scholastic, Medical, and Clerical.—There are numerous agencies in London and also in the provinces for bringing together parties whose educational wants are complementary. Some restrict themselves to one particular branch of educational business – for example, there are 'governess agencies,' which bring into communication governesses and persons that wish to engage governesses; 'medical agencies,' which limit themselves to the satisfaction of the needs of medical gentlemen that wish to find situations, and medical gentlemen that wish to be provided with assistants, partners, or new fields of work, and so forth. Other agents extend their connections to all branches. After due inquiry they place on their books the names of ladies and gentlemen who wish to find situations as assistants in schools, or as visiting tutors to private families, or as travelling tutors; who wish as principals to engage assistants, who wish to enter into partnership or to receive a partner, who wish to sell or to purchase a school. They also recommend to parents and guardians satisfactory schools in which to place their children, according to the individual requirements, both at home and abroad. The commission charged is very reasonable at all respectable agencies—generally 5 per cent. on engagements at home, and 10 per cent. on engagements abroad, and for partnerships and transfers 5 per cent. on the money (or money value) that passes. In spite of the abuse of their position by some agents, and the deliberate swindling of impostors describing themselves as agents, the system is undoubtedly of great assistance to both parties to each transaction, particularly when the agent has a good connection and is competent to judge of the qualifications and needs of the applicants. It is strange that so few agents seem to have had personal experience in teaching, or to be of such academical standing as to justify reliance on their judgment in the cases that come before them. The fact that one London agency is personally conducted by two graduates of high academical as well as educational standing is sufficiently noteworthy; it is especially creditable to the system, and affords exceptional assurance of intelligent guidance.

Agricola, Rodolph, *b.* near Groningen, in Friesland, in 1443. His first master is said to have been Thomas à Kempis. He distinguished himself at school, and then proceeded to Louvain, where he graduated. He subsequently studied Greek under Theodore Gaza at Ferrara. Here he also lectured on the Roman language and literature. He returned to Holland, and was professor for a short time in Groningen. In 1482 he removed to Heidelberg, upon the invitation of the Bishop of Worms, and there he was appointed professor. He studied Hebrew with great success, and gave lectures on ancient history; but a sudden illness put an end to his career at the early age of forty-two. Agricola's classical attainments were of the highest

order, and he has been greatly praised by the elder Scaliger and Erasmus. His chief work is *De Inventione Dialectica*. This was ordered by Henry VIII., in 1535, to be taught in the University of Cambridge together with the genuine Logic of Aristotle; and there is the same recommendation in the statutes of Trinity College, Oxford. Agricola attacked Scholasticism with great energy, and this alone would entitle him to a position amongst the pioneers of modern education. He was probably the first man who sought a means of educating the deaf and dumb. He was also the first to introduce the Greek language into Germany.

Agricultural Education. — Agriculture, with its various subdivisions and allied pursuits, including the tillage of the fields, horticulture, floriculture, forestry, and pastoral, dairy, and poultry farming, is the most useful and universal of all branches of human industry. It is the main source of all products employed as food for men and domestic animals, or as the raw materials for clothing and many branches of manufacturing industry. Being a practical art, involving a multitude of applications of the principles of most of the physical sciences (such as geology and chemistry, illustrating the qualities of soils and manures, meteorology, mechanics as applied to agricultural machinery, veterinary medicine and surgery as applied to domestic animals, zoology and botany, &c.), agriculture cannot be pursued with advantage in the present day without a sound theoretical as well as practical training. The recognition of this truth, which has been brought home to the dullest comprehension by the vast progress made in agricultural chemistry through the labours of Liebig, Lawes, and others, has led to the establishment in all the civilised countries of the world of numerous special institutions for the training of young men intending to take up farming or any of its allied pursuits as the business of their lives.

Before the rise of chemistry the precepts of agriculture were necessarily empirical; but in this pre-scientific period the English farmer, proceeding by the 'rule of thumb' and ancestral traditions, succeeded in bringing practical farming to a wonderfully high state of perfection. The varieties of cattle, sheep, pigs, and horses bred in England surpassed anything of the kind produced elsewhere throughout the world. To this practical success is probably to be attributed the fact that when agricultural theory was revolutionised by the progress of chemistry the necessity of a theoretical training was less quickly recognised in England than in some foreign countries. One of the first attempts in the way of a scientific school of agriculture was made in 1795 by Thaer, at Celle, in the kingdom of Hanover, then part of the dominions of the English Crown. The success attained by this gentleman was such that he was invited by Frederick William III. of Prussia to establish a higher agricultural college in that kingdom, and the institution he founded in 1806, at Möglin, in the province of Brandenburg, in combination with a model farm, has been the pioneer of a host of similar establishments in all parts of Germany. The agricultural academies at Hohenheim in Würtemberg, Proskau in Silesia, Weihenstephan in Bavaria, Waldau in East Prussia, and others, were all modelled on that of Möglin. At Jena Sturm founded an institute whose pupils attended the university classes in the winter, and a course of practical training on well-managed farms in the summer. At Poppelsdorf and at Eldena there were special agricultural academies connected with the Universities of Bonn and Greifswald respectively, while other academies were associated with the Polytechnic High Schools of Brunswick, Carlsruhe, Darmstadt, and Munich in Germany, and Zurich in Switzerland. Nearly all the Prussian universities now have agricultural institutes connected with them, special attention being paid to agricultural chemistry. In addition to this highest collegiate class there exist in Germany two other grades of institutions—the middle agricultural schools and the elementary or lower grade schools. Of the last mentioned there were fifty-three in Prussia alone in the year 1878, comprising twenty-six agricultural schools open winter and summer, fourteen winter schools, three schools of pastoral farming, and ten schools of horticulture and fruit culture. The Prussian Government grants to these establishments nearly 50,000*l.* annually. In several other parts of Germany agricultural educational institutions are, if anything, relatively more numerous than even in Prussia. In Würtemberg, besides the higher establishments, there are 783 agricultural continuation schools, attended by upwards of seventeen thousand

scholars. In Russia, in France, and in Belgium, as well as in most other Continental countries, agricultural instruction has also received great attention. Austria possessed in 1879, in addition to the Agricultural College at Vienna (with nearly five hundred students), as many as sixty-eight institutions devoted to agriculture. In France agricultural education is being promoted with energy, and in addition to agricultural schools and colleges, the French Government have appointed itinerant lecturers on agriculture.

In Great Britain there are no Government institutions of this class, the field being still left to private enterprise. Chairs of agriculture, however, have been founded in some of the British universities. The Royal Agricultural College at Cirencester was founded in 1845. The students, who go through a course of two years' instruction, are partly resident, partly non-resident, the fees amounting to from 40*l.* a year for the latter to 80*l.* for the former. The curriculum embraces a thorough scientific and practical training in the college classes and laboratories and on the extensive farm attached to the college. The Downton College of Agriculture was founded in 1880 for the technical training of land cultivators, agents, and surveyors. The Albert Memorial College at Framlingham devotes a part of its curriculum to agriculture, and classes for instruction in the science are also held at the School of Mines. Scotland possesses an agricultural college at Glasgow.

The authorities of several provincial colleges of the United Kingdom have introduced the principles of agriculture into the course of training, and instruction in the subject is encouraged and aided with grants in the elementary schools. Under the Code, the principles of agriculture may be taken up—(1) by the scholars in elementary schools, as a branch of elementary science, which is recognised as a class subject; (2) by the older scholars, in the three highest Standards, as a specific subject; (3) by pupil-teachers and assistant-teachers, as an optional subject, during the course of their engagement: if they do take it up and pass successfully at one of the (May) examinations held by the Science and Art Department, grants are made on their behalf by that Department, while their success is registered and marks allowed for it in any examination they subsequently attend as candidates either for admission to a training college or for a certificate of merit; (4) by students in training, as a special science subject, during either or both of the two years of their residence in a training college. (For full information relating to the examinations in the principles of agriculture, instituted by the Committee of Council on Education, *see* the *Directory for Establishing and Conducting Science and Art Schools*, annually issued by the Education Department: Eyre & Spottiswoode.)

In Ireland the Commissioners of National Education have paid much attention to this department of education, and twenty years ago there were 166 farm-schools in active operation, all with land attached ranging from two to a hundred and twenty acres. Of these nearly half (seventy-six) were workhouse agricultural schools, while forty-eight were ordinary agricultural schools. The instruction given in these, however, is only of the most elementary description, training ordinary school children in the common operations of gardening and the field. Of higher pretensions than these are the thirty-seven model agricultural schools in various parts of the island. Besides these there is one superior establishment, the Model Training Farm at Glasnevin, founded in 1838, where a hundred young men selected from the minor schools receive a more complete course of instruction. A considerable number of the students here receive board, lodging, and two years' education gratuitously, with a view to becoming farm managers or stewards; while another section consists of school-teachers, who in their later career have to conduct the lower classes of agricultural schools. At Templemoyle, in Derry, there is another agricultural seminary, which has turned out a thousand well-trained agriculturists in the first thirty years of its existence. The total number of pupils in all the agricultu schools and academies in Ireland is upwards of three thousand, and the expenditure involved is upwards of ten thousand a year. (*See* FORESTRY.)

Ahn, John Frank (*b.* 1796, *d.* 1865).—In 1834 he published, in German, his *Practical Method for the Rapid and Easy Study of French*. The work was an immense success, and was translated into many languages. His principle was to apply to the learning of foreign languages

the same method which a child follows in acquiring its mother-tongue. There was to be no grammar to begin with, and the whole was arranged in a plan of three courses. His method, no doubt, gave an impulse to the study of modern languages.

Alcuin (735(?)–804), an eminent ecclesiastic and reviver of learning in the latter part of the eighth century, was born in Yorkshire. He was invited by Charlemagne to assist him in his educational schemes, and was placed at the head of the Palace School attached to the Court, where he instructed Charlemagne and his family, amongst others, in rhetoric, logic, mathematics, and divinity. Under Alcuin's directions a scheme of education was drawn up, which became the model for the other great schools established at Tours, Fontenelle, Lyons, Osnaburg, Metz, &c.—institutions which ably sustained the tradition of education on the Continent till superseded by the new methods and new learning of the commencement of the university era. In 801 Alcuin obtained leave to retire from court to the abbey of St. Martin at Tours, of which he had been appointed the head. Here he remained and taught till his death in 804. A life of Alcuin by Lorenz was published in 1829, and was translated into English by Slee in 1837.

Algebra, to use Newton's expression, is 'universal arithmetic.' Whereas arithmetic deals with particular numbers, algebra deals with numbers in general; and whereas the former treats of numbers in connection with concrete things, the latter treats of number in the abstract. These are only two of the most marked distinctions, stated broadly. There is another, which is even more fundamental. The operations of arithmetic are capable of direct interpretation *per se*; those of algebra are often only to be interpreted in relation to the assumptions on which they are based. For example, in arithmetic proper the operations denoted by indices are very limited; but within those limits the interpretation is perfectly definite—they refer to certain areas, certain cubes, &c.—and it is clear that these indices must be whole numbers, with regard to which the ideas of *positive* and *negative* are inapplicable. In algebra we go beyond this, and work with indices which are fractional, and to which we *do* apply the ideas of *positive* and *negative*; and the operations performed can be and are interpreted; but only in relation to the assumption on which the whole theory of indices is based, viz. that the multiplication of a^m by a^n shall *always* give a^{m+n} as a result, whatever a, and m and n may denote. It is true that it is very common in schools to divorce the arithmetic from concrete reality, and to work with the symbols merely as symbols. But even then the operations employed are only the writing in symbols of certain particular definite operations, which might be understood all along, and which can be at once interpreted by themselves. In algebra, on the other hand, we look upon our operations mainly as the manipulation of symbols pure and simple; and when we have arrived at results we seek interpretations of them by comparing them with our assumptions. The treatise written by Diophantus in the middle of the fourth century may be taken as the foundation of Greek algebra; and from him and other Greeks the Arabians probably gained much of their knowledge. But it is to the Arabians themselves that Europe *directly* owes its knowledge of algebra, as the name implies [*al* = the, and *jabr* = consolidating]. Their methods were introduced into Europe by Leonardo, a merchant of Pisa, in 1202 A.D. The first *printed* Algebra was by Lucas de Burgo, a Minorite friar, in 1494 A.D. The first *English* treatise on Algebra was by Robert Recorde, teacher of mathematics and practitioner in physic at Cambridge. It was called the 'Whetstone of Wit,' and was published in 1557. As regards the method of teaching algebra important developments have taken place, and new departures have been adopted recently. On the subject of the new algebra the reader may consult Professor Chrystal's and Mr. W. Steadman Aldis's excellent text-books.

Alleyn, Edward.—A celebrated actor, who devoted his wealth to the foundation of Dulwich College, in 1619. The college was reconstituted by Act of Parliament in 1858. It consists of an educational and eleemosynary branch, a chapel, library, and a fine picture-gallery, the last bequeathed, in 1810, by Sir P. F. Bourgeois. The educational branch comprises the upper school and the lower school. In the upper school there are eight exhibitions of 50*l.* a year each, tenable for four years at the universities, or by any student of a learned or scientific profession or of the fine arts; also thirty-six scholarships of 20*l.* a year each, awarded to boys between

twelve and fourteen years of age. In the lower school gratuities of 20*l.* and 10*l.* are granted, at the annual examination, to the most deserving boys then leaving the school.

Alma Mater (Latin, *almus*, cherishing, dear), the name applied in England to the particular university which a student has attended.

Alphabet is the term applied to a collection of symbols used to express the sounds that occur in a language. The term is derived from the first two letters of the Greek alphabet, Alpha Beta, which took the Latin form *Alphabetum*, but that word does not occur in any prose writer before Tertullian. All alphabets may be traced back to five forms—the Egyptian, cuneiform, Chinese, Mexican or Aztec, Yacutan, and Central American. The Egyptians seem first to have invented the alphabetical system, and their earliest form was the hieroglyphics. These hieroglyphics were pictorial, and indicated words. They are sometimes spoken of as 'the sacred letters'; and there seem to be some cases where the hieroglyphs were used to represent articulate sounds. Derived from the hieroglyphics by a process of degradation is another set of characters, called the Enchorial (i.e. of the people). These Enchorials seem first to have been phonetic powers, perhaps syllables, then mere letters. The Phœnicians are said to have derived their symbols from the Egyptians. Our alphabet is derived from the Phœnician; and the same is true of Hebrew, Syriac, Arabic, Greek, Latin, and German. But the names given by Phœnicians to letters did not represent the sounds. The Romans seem first to have named their letters from sounds, and probably the order of the letters is based on a classification of sounds, though it is now difficult to trace its development.

Alumnat (*alere*, to nourish, med. Lat. *alumnatum*), the appellation of institutions in Germany where, in addition to education, board and lodging are provided for students. In the Middle Ages such institutions were connected with monasteries, and the pupils, in return for their gratuitous instruction and board, performed various services for the church and school. Maurice of Saxony founded some of the more celebrated of these schools in the sixteenth century.

Alumnus is really a Latin adjective, derived from *alo*, to feed, to bring up; but it is chiefly used as a substantive: (1) literally=a nursling, in this sense chiefly by Latin poets; (2) trop.=a pupil. Cicero appears first to have used it in this way in reference to the disciples of Plato. It passed from that source into our own language when Latin was so commonly used, and it still remains, whether applied to a student of his college or to a pupil of a professor or tutor.

America, Education in. *See* LAW (EDUCATIONAL).

American Universities. *See* UNIVERSITIES.

Amoross, Don Francisco (*b.* in Spain 1770, *d.* at Paris 1848), spent his early years in the army, and saw active service. In 1803 he superintended the direction of a military institute at Madrid for the reformation of public education in Spain. He adopted the method of Pestalozzi. He was taken prisoner in 1808, at the close of the revolution, but soon released. Later he fled to France, and offered his services to Napoleon. He was made a member of the 'Society for Elementary Education' in Paris, and published a work on the method of Pestalozzi. Soon he was able to commence a course of teaching in the capital. He had many pupils, and received government support. In 1819 a military college was founded, and he was appointed director. His method consisted in graduated exercises for full physical development, and was especially noted for the fact that this physical development was made to contribute to the unfolding of the moral faculties.

Analogy.—Reasoning by analogy commonly means inference from one case to another on the ground of resemblance. It differs from the stricter forms of logical reasoning, inasmuch as we are not certain that the points of resemblance observed are necessarily connected with the matter inferred. In many cases, too, of argument from analogy the resemblance is only slight and superficial, and this makes the reasoning still more precarious. This applies to all reasoning from facts and laws of the physical world to analogical processes in the mental and moral world, as when we illustrate the operation of acquiring knowledge by analogies with the physiological processes, digestion, assimilation, &c. Children's reasonings, before they become capable of the more exact

logical forms, are grounded on the perception of resemblance, and so may be described as analogical. In illustrating new subjects to children, the teacher frequently finds it necessary to resort to analogy. Great care should here be taken to choose suitable analogies, and not to strain them, so as to make them prove more than they are capable of proving. Since analogy is a defective form of reasoning, only useful where the more perfect forms are inapplicable, it should be resorted to less and less as the child's reasoning faculty develops. (On the logical use of analogy, *see* J. S. Mill, *Logic*, bk. iii. chap. xx. The use of analogy in illustrating subjects of instruction is dealt with by Isaac Taylor, *Home Education*, chap. xi.)

Analysis and Synthesis.—By Analysis is meant the resolving of a complex whole into its parts or elements; and by Synthesis, the reverse process of combining parts or elements into a whole. Physical analysis and synthesis are best illustrated in the chemical processes. As applied to intellectual operations the terms are somewhat ambiguous. One clear instance of analysis is supplied by abstraction, in which the mind breaks up the concrete whole given in perception into a number of constituent properties. (*See* ABSTRACTION.) As supplementary to this we have a process of synthetic construction, as when the mind through the medium of verbal description forms an idea of an unknown chemical substance by a new combination of known qualities. In a somewhat loose manner, Analysis is used to denote induction, Synthesis deduction. A stricter employment of the term 'analysis' in connection with reasoning confines it to the resolution of complex effects into their separate parts, and the reference of these to their proper causes. The terms have come to be employed in education to denote a contrast of method. Thus it is customary to distinguish between an analytical and a synthetical way of teaching a language, and the meaning of the phrase 'grammatical analysis' has become well defined. In geometry, again, which is largely an illustration of the synthetic building up of complex ideas out of simple ones, analysis also occupies a subordinate place. While the antithesis has thus a certain significance and utility, its vague and fluctuating meaning seems to render it unfit to serve as a fundamental distinction in educational method. (*See* Jevons, *El. Lessons in Logic*, xxiv.; Bain, *Ed. as Science*, chap. iv., and Compayré, *Cours de Pédagogie*, pt. ii. leçon i.)

Analysis of Sentences.—Two different processes are often comprised under this term: (1) 'grammatical' analysis (parsing); (2) 'logical' analysis. The difference between them is essentially one of the degree of detail to which the analysis of the sentence is carried. Logical analysis deals with groups of words and assigns the part played by each in the structure of the sentence; parsing directs attention to the part played by each separate word and the various characters which may be ascribed to it. It follows that analysis ought to precede parsing; the broad outlines of the sentence should be marked out before the question of the function of each word is raised. Thus it is difficult to define a noun except in relation to the ideas of subject (or object); adverbs, prepositions, and conjunctions cannot be truly distinguished except by consideration of their function in the sentence. Experience seems to show that children deal more naturally with groups of words ('thought-units') than with individual words, and find their way without serious difficulty through the outlines of the analysis of simple and compound (complex) sentences. A noun clause is to them a many-worded noun. To be able to recognise 'when I come' as an adverb clause is certainly easier than to assign its precise function and character to 'when.' This is especially applicable to the teaching of English. Owing to the loss of inflections in modern English, words do not any longer bear their character stamped upon them or tell their own tale. A large number of words may serve as various parts of speech, as Dr. Abbott has shown. The treatment of words in groups is thus imposed by the genius of the modern language, and to this fact the wide-spread adoption of analysis in English-speaking countries bears witness. Parsing may easily become an exercise worse than useless in English teaching, if it degenerates into a tedious enumeration of all the characters which may be assigned to any single word; still more if it leads to the discovery of characters in words which they do not really possess (*e.g.* gender in nouns); and the protest which has arisen on many sides is thoroughly justified. But

parsing when not thus vitiated by false methods is a necessary and useful adjunct of analysis. A word of caution: Much time would be saved if teachers, instead of asking the pupil to 'parse' every word about which any question arises, would direct his attention to the particular point at issue—e.g. by asking, 'What is the tense of this verb?' 'What is the case of this pronoun?' 'What is the perfect participle of this verb?'

The method of so-called 'logical' analysis is of comparatively recent date. It was originated in Germany by K. F. Becker (*Deutsche Sprachlehre*, 1827). In opposition to the empirical methods then in vogue, he based his grammar upon thought relations and logical distinctions. Becker's system exercised a great influence not only upon the teaching of German, but also upon that of Latin and Greek; it was introduced into England by Dr. Morell, and various improvements in detail were made by Mr. C. P. Mason. It has been much criticised from various points of view, but not superseded. Probably its defects have arisen from a mistaken view of the relation of grammar to logic, from which Becker himself was not free. Grammar and logic are not coincident, though they have their points of contact. Thus logic is justified from its own point of view in casting every judgment into the mould of subject, copula, and predicate. But logic neglects many finer shades of meaning which are grammatically of the highest interest ('Birds fly' is not='Birds are flying'); and in many other ways grammar may be vitiated by the intrusion of logic. For logic concerns itself only with the import of propositions; grammar with their import as expressed in a certain form of language. Hence an analysis which contents itself with stretching every sentence upon the Procrustean bed of the logical judgment may easily do violence to language. A warning is needed against analysing in the way in which 'a butcher analyses sheep' (Mr H. Bradley, *Academy*, January 1886). The process of sentence analysis must be conducted on true grammatical lines; so conducted it forms a sound basis of rational grammar teaching, not merely in English, but in foreign languages too.

The grammatical division of the sentence is into two parts, corresponding to the two elements in every 'complete thought':

Subject.	Predicate.
The man	*is a traitor.*
Birds	*fly.*

Whether every sentence can be thrown into this form is a matter of opinion. The question is admirably discussed in Paul's *Principien der Sprachgeschichte* (translated by Professor Strong), in connection with the views of Miklosich as to 'subjectless sentences' (e.g. *speak*, *pluit*) and the difficulties involved in defining the term 'sentence.' The terms 'subject' and 'predicate' are incapable of definition except by reference to one another. The 'subject' is the word or group of words denoting that of which the action denoted by the predicate is declared; the 'predicate' is the word or the group of words denoting that which is declared of the thing denoted by the 'subject.' Any more confined definition of these terms must be imperfect; if we say, as is very commonly said, 'The subject is the word or group of words denoting that of which *something* is declared,' or 'The subject is the word or group of words denoting *that which is spoken about*,' the definition may practically answer the purpose; for experience will show the pupils what is really meant. But, strictly speaking, '*something*' is declared of other parts of the sentence besides the 'subject.' For instance, in such sentences as 'This ambition I do not share,' 'At lovers' perjuries Jove laughs,' '*something*' is said of 'this ambition' (i.e. that I do not share it), and of 'lovers' perjuries' (i.e. that Jove laughs at them); and these notions being in fact the emphatic parts of the sentence naturally present themselves to the mind when the question is asked, 'About what is something said in this sentence?' Children before they have acquired grammatical experience are apt to assign the same word as subject of the following sentences, 'Wellington conquered the French at Waterloo,' and 'The French were conquered by Wellington at Waterloo.' To sum up: the subject cannot be defined except by reference to the *full predicate*. Whether the clumsy definition which results is of any use for teaching purposes opens up a question too wide for discussion in this place. *See* Definition.

Grammarians are not agreed as to the best way of using the terms 'subject' and 'predicate.' The general method is to dis-

tinguish *logical* (or *full*) and *grammatical* subject, and *logical* (or *full*) and *grammatical* predicate, and to use the terms subject and predicate in parsing as equivalent to grammatical subject and grammatical predicate. Thus in the sentence 'The fair breeze fanned my cheek softly,' *breeze* would be the (grammatical) subject and *fanned* the (grammatical) predicate. This method has the advantage of providing convenient terms for the cardinal *words* of the sentence; the objection to it is that it sacrifices the words subject and predicate as names for the two *parts* into which the sentence primarily falls (compare, too, what is said below about qualifying parts of the sentence). It is open to those who think that subject and predicate should be kept for this sense to distinguish *breeze* as the 'subject-word' and to call *fanned* simply 'verb'; though it would doubtless be desirable, if possible, to find for the verb some term which was not a term of parsing. With regard to the proper use of certain other terms of analysis, divergencies of opinion exist. It is one of the chief merits of Mr. Mason to have given a definite and useful meaning to the term 'complement,' which has been so vaguely used in France (*complément direct*; *complément indirect*); this term is now generally understood to denote the part of the sentence which completes the meaning of a verb of 'incomplete predication' (i.e. a verb which does not make complete sense by itself).

As the infinitive (used after another class of 'incomplete' verbs) plays a very different rôle in the sentence from the adjectives and nouns, called complements, some grammarians have thought it desirable to mark this use of the infinitive by a special name—'prolative infinitive' (i e. infinitive which *extends* the meaning of the finite verb) is the term employed in the Public School Latin Primer; when first introduced in that book it met with a storm of opposition, but is now widely used. The term 'supplementary infinitive' has also been suggested. But whatever term is employed there would seem to be obvious advantages in recognising by a separate term this characteristic feature of the Aryan languages; in such a sentence as 'He seems to be rich,' the complement is *rich* (compl. of the infinitive *to be*), not *to be rich*.

The term 'indirect object' is used very variously, and the question arises whether indirect object should be analysed as coming under the 'object column' or the 'adverbial adjunct column.' The question is complicated by the obliteration in modern English of the distinction between dative and accusative. It is undoubtedly true that in modern English we may say not only 'I told him the story,' but also 'He was told the story'—i.e. the indirect object may become the subject of a passive verb. But in languages which preserve the distinctive case inflections, this is impossible; and it is urged with force that the indirect object is as adverbial in character as any prepositional phrase (He sent it *to the post*).

The classification of noun (substantival) clauses presents considerable difficulty in regard to details. But the main classes generally accepted are: (1) indirect statements; (2) indirect petitions (commands); (3) indirect requests. There is a difficulty in regard to such a sentence as 'It is strange *that such things should be*'; this differs from 'It is strange *that such things are*,' as containing not a statement of fact, but rather an expression of contingency. Such a clause is called by Mr. F. Ritchie (*English Grammar and Analysis*, 1886) an 'indirect thought.'

The qualifying parts of the sentence (attributes, adverbial adjuncts) are very commonly treated as *enlargements*, by which the *naked* sentence is *clothed*. This is open to serious objections, such as those urged by Dr. F. Kern (*Deutsche Satzlehre*, 1883) and by Mr. J. Spence (*Journal of Education*, 1884). In such a sentence as 'Birds that are web-footed swim in water,' it is certainly misleading to speak of the clause *that are web-footed* as an 'enlargement'; the statement is made not about *birds*, but about *birds that are web-footed*. These objections do not apply to the method of breaking up sentences into parts, if it be recognised that the process is an abstract one, and that at every stage of analysis we get farther and farther away from the actual sentence before us; they apply only to the synthetic *reconstruction* of the sentence out of the elements which result from the process of analysis.

The most common form in which sentences are analysed is a ruled table containing headings for subject, predicate, &c. Dr. Bain (*Teaching of English*, 1887)

objects to the derangement of the order of words in the sentence which results, and this is certainly felt as a difficulty, especially in analysing French and German. In some schools the sentence to be analysed is written out vertically and the description of the parts (subject, object, &c.) are written opposite. This is the method adopted by Mr. Fitch (*Lectures on Teaching*, p. 268). There are two points of importance to be kept in view: (1) the best method of indicating the relation of the words in each group; (2) the best method of indicating the relation of each group to the others. For the latter purpose the generally employed form of a tree is useful.

Answer. *See* QUESTION AND ANSWER.

Antiquity, Schools of. *See* SCHOOLS OF ANTIQUITY.

Aporti, Ferante, the celebrated founder of infants' schools in Italy, was born in 1791, in San Martino, in the province of Mantua. From childhood he was destined for the priesthood. Yet, whilst pursuing the usual studies eagerly, he never ceased to interest himself in the progress of his nation, especially in the education of the children, for by this means only did he think it possible to save Italy. He was professor of history in Cremona, and was also appointed inspector of schools there. He soon discovered that the great defect in the national education was the absence of any early culture. Italy had at that time many little schools, which were conducted by ignorant old women, very much like our dames' schools of forty or fifty years ago. Aporti felt that education should commence from the cradle, and devised a plan of education to precede that of the ordinary school. In 1827 he made his first attempt, and opened a small school in Cremona for the children of the rich. His method has been described as 'development of the body by means of a sound *régime*, frequent recreation, short hours of work, and gymnastic exercises suitable to the age of the children; formation of the heart by good examples and wise precepts; culture of the spirit by teaching of a kind fitted to their intellectual capacities, so that it resembled play rather than a task.' Brilliant success crowned his effort, and the government of Milan approved his method by public decree. Numerous places followed the example of Cremona, and in 1833 Aporti published a manual to serve as a guide to the promoters of these infants' schools. Not satisfied with this, he spent any time that could be snatched from his many duties to go and visit these schools. He was accused of introducing a spirit of irreligion and revolt by this method, but he pursued his course without relaxation till thousands of schools bore witness to the success of the system he had inaugurated. By special invitation he opened a school at Turin, in the heart of the university, and thus effected a complete reformation in Italian teaching. Distinctions were showered upon him. The French Government bestowed on him the title of 'Knight of the Legion of Honour.' Though he fled to Piedmont as a refugee, Victor Emmanuel raised him to the rank of a senator in 1848. In 1855 he was elected with every mark of dignity to be President of the University of Turin. There he died in 1858, but he still lives in the memory and speech of his countrymen as 'the Father of Childhood.'

Apparatus.—Catalogues containing price lists of apparatus, instruments, diagrams, &c., to illustrate the following sciences, and obtainable from various manufacturers, have been prepared, and can be had on application:—1. Practical Geometry, Machine and Building Construction, Mechanics, and Steam. 2. Experimental Physics. 3. Chemistry and Metallurgy. 4. Geology and Mineralogy, Natural History (Physiology, Zoology, and Botany), Physiography, and Agriculture. A skilful teacher will be able to save much expense, and to make his subject increasingly attractive to his pupils, by constructing his own apparatus where possible. The greatest discoverers in science have worked with rough apparatus of their own invention and construction.

Aquinas, Thomas. *See* SCHOLASTICISM and MIDDLE AGES (SCHOOLS OF THE).

Architecture of Schools.—Conspicuous among the questions which the universally awakened interest in education has brought up for discussion is that of the architecture and planning of school buildings. When the curriculum of secondary schools was confined to Latin and Greek grammar and translation, and of primary schools to reading, writing, and ciphering, the structure of the school in which these comparatively simple operations were only too mechanically performed was only too mechanically simple. However imposing

might be the external appearance—and some of these old schools very creditably reflected the ecclesiastical origin of their foundation—the interior could boast of very little accommodation for school purposes beyond one large schoolroom. In this all the scholars were taught all the subjects, the masters' desks being dotted about the floor, with a clear space round each desk, in which the class stood for 'lesson,' and then was relegated for 'preparation' or 'writing' to desks placed either against the walls, or face to face, or in other ways determined by no higher consideration than that of convenience or close packing. But the day of these things has gone by; the extensions of the curriculum to include subjects requiring more space, greater quiet, or special arrange ments for their adequate treatment; the improvements in methods of instruction, coupled with the introduction of a greater variety of methods; and, beyond this, a far higher conception of the parts which good order, decency, and considerations of health should play in the education of youth, have completely altered the aspect of the architectural question. From being a very simple one it has now become one of the most complex. The adaptation of school buildings to their diverse purposes has made infinite attention to details supremely important. These details, their effect upon the discipline, comfort, and efficiency of a school, it has become part of a schoolmaster's professional duty to study and to master. In designing school buildings his services, as the only possible expert in these matters, are indispensable side by side with those of the professional architect.

A school, like every building, ought to have a character of its own, and to bear upon its exterior the marks of the purpose for which it was erected. Being neither a church, nor a town-hall, nor a post-office, nor an asylum, nor a workhouse, it should not suggest any of these to the eye. By its approaches, its façade, its ornament, it should reflect the quiet dignity as well as the practical utility of the work carried on within its walls.

The *site* should, whenever possible, be a large open piece of ground, not hemmed in by houses, but free to the four winds and the direct action of the sun. Its area, including playgrounds, should be at least five square yards per scholar; or more, if the whole school has its recreation at the same time. Its boundaries should be no higher than is absolutely necessary. In the country or quiet suburbs of a town, low walls, surmounted by iron palisading about six feet high, make the best boundaries. In the middle of a town the necessity of avoiding distractions from the streets demands higher walls, but they need not exceed six feet.

The buildings.—The whole of the surface soil should be removed from the site to be occupied by the buildings, and the ground under the floors should be covered with a uniform layer of concrete. A space of at least a foot should be left between the top of the concrete and the under-side of the floor joists, and this space should be thoroughly ventilated. The ideal school contains no staircases, so that the building should consist of only one storey, where the site is large enough for the purpose; and should never, under any circumstances, exceed two storeys. The main building should have at least two entrances from the public thoroughfares. It should consist of an assembly hall, and a number of class-rooms sufficient to accommodate the whole school without using the assembly hall. This leaves the hall free, as it should be, for examinations, when the accommodation of the class-rooms would obviously be insufficient, for collective lessons, recitations, singing, &c. The assembly hall should, whenever possible, be a 'central' hall—i.e. should have the majority of the class-rooms arranged round it, and communicating with it, either directly or, better still, with an intervening corridor. In a two-storeyed building the hall would run up to the height of the upper storey; and a gallery round the hall at the level of the first floor would make communication with the class-rooms on that floor easy.

The advantages of the 'central hall' arrangement are: (1) the whole school can meet and disperse to the several class-rooms with the least possible delay or disturbance; (2) the head-master and the various school officials can visit or take round notices with the least possible waste of time and energy; (3) the central hall can be made a reservoir of fresh warm air, which can supplement the other means of ventilating the class-rooms and corridors, and, on the other hand, when the hall itself is full of people, as on 'speech days'

it can be ventilated from them ; (4) economy in the matter of cost is effected, as the main walls serve a double purpose. Intervening corridors have the great advantage of enabling examinations and other collective teaching to be continued without interruption from the movement of the scholars from class-room to class-room or to the playground. The difficulty of adequately lighting the central hall may be overcome by placing cloak-rooms, masters' rooms, and other rooms not running up to the same height as class-rooms, at each end of the central hall, thus permitting large windows high up at each end. Sky-lights or dormer-windows in the roof would further contribute light. The corridors, if parallel with the side walls, and therefore long, would be lighted at each end, or, if at right angles between every pair of class-rooms, and therefore short, would be lighted from one end. Sky-lights are to be avoided, whenever possible, as a storm of rain or hail produces noise, and of snow, darkness.

The capacity of the central hall should be calculated at six square feet for each person to be seated on public occasions.

Class-rooms.—If the class-rooms are lighted on one side, as would mostly be the case, the room should be arranged so that no shadow shall be cast by the pupil's body on his book or paper, and for this purpose the light should fall on his left hand. There is no objection, and in fact a distinct advantage, where ventilation is taken into account, to having windows on two adjacent sides. No class-rooms should be placed on the north side of the building unless some of the windows can be placed so as to afford direct sunlight. The area of window surface should never be less than one-sixth of the area of the floor, and may be one-fifth with advantage. The window-sills should be 4 ft. 6 in. above the floor. The area of the floor should be calculated, in elementary schools, at ten square feet to each pupil, and should never be less than this ; in secondary schools, it may reach fifteen or sixteen feet with advantage. The height should be, in all schools, at least fourteen feet.

The master's desk and dais should be in the middle of the long side of the room, with the light (necessarily) on his right. When at his desk, or at the blackboard behind it, he should have the whole class well in view, and therefore be well back from the front row of desks ; and the longer the rows, the further back must his desk be placed, and therefore the wider must the room be. Consequently an arrangement which permits of eight pupils in each long row (in single or dual desks, and allowing twenty-four to twenty-six inches 'elbow room per pupil) is usually more economical of floor space than one for ten pupils in each row. If the dais is sufficiently high (eighteen or twenty inches) a stepped or sloping floor is quite unnecessary ; and there is an obvious economy in the principle of raising the master above the pupils for purposes of supervision, as against the opposite one of raising the pupils in tiers above the master. Besides, the noise of the pupils' movements and the fatigue to the master in moving about among his class, when on a stepped floor, are good pedagogic reasons for a sparing use of such an arrangement. The most appropriate place for a stepped floor (where it is most required, i.e. in an elementary school) is one extremity of the central hall. The class-room walls should be lined inside, to a height of from 2 ft. 6 in. to 3 ft. 6 in. (according to the average height of the scholars using the room), with a dado, which may be of wood, tiles, or painted cement. The height of this dado should be varied as stated in order to allow of that most effective piece of school apparatus known as the 'continuous blackboard' being placed round at least three of the walls immediately above the dado, on which the scholars can work in the presence of the teacher.

Corridors and staircases.—The corridors should be at least five feet wide, so as to allow two streams of scholars to be moving in opposite directions without risk of inconvenience or disturbance. The flooring may be of wood-blocks or asphalte. Staircases in schools are open to numerous objections. They are noisy, they are dangerous, they are a fruitful source of breaches of good discipline, and they seriously add to the labours of supervision. If, as in a two-storeyed building, they are necessary, they should be of the same width as the corridors, they should on no account be spiral, but should have short flights with wide landings, and the flooring should be of wood-blocks. Care should also be taken in two-storeyed schools to have the floors of the class-rooms on the upper

story constructed of sound-proof materials, such as girders and brick or concrete arching, which have the advantage of being non-conducting both to sound and fire.

Science-rooms.—The position of science in the curriculum of all secondary schools being now fully established, the proper construction of the lecture-rooms, laboratories, apparatus-rooms required for the teaching of chemistry, physics, and physiology, has become a matter of prime importance. The recommendations of the Royal Commission on Technical Instruction are forcing the question of elementary scientific and technical instruction upon the attention of the managers of elementary schools ; but, in the case of this latter class of schools, it will probably be found convenient, especially in large centres of population, to erect a special school-building to which pupils would be drafted from the other schools : though the time is probably not far distant when a laboratory and workshop will be considered necessary adjuncts of all elementary schools in artisan neighbourhoods. Science-rooms, to whatever kind of school attached, should be in a separate block, near the main building, and readily accessible by a covered way. Otherwise the rest of the school will run the risk of being incommoded by fumes, and the chemical and physical students, of being disturbed in their investigations by the vibrations accompanying the movements of large numbers. The rooms should not be lighted on the south or west side, but should face either north or east, in order to avoid, as much as possible, the ill effects of direct sunlight upon chemicals and apparatus. The warming and ventilation of the science-rooms should be on the same principle as for the main building, only the areas of the inlets and outlets of air should be much larger.

Cloak-rooms.—The extent to which accommodation for caps, great-coats, umbrellas, &c., is required varies considerably with the character of the school. In a boarding-school, where the boarding-houses are clustered round the school, or in a day school, where the pupils live within short distances of the school, hardly any cloak-room accommodation is required ; the corridors or covered ways may be fitted with pegs, and little else would be wanted except, perhaps, a drying-room connected with the hot-water apparatus, to receive the great-coats after a heavy downpour of rain. But in a day school of any kind, especially in towns where the schools are large, too great importance cannot possibly be attached to the supply of sufficient cloak-rooms. On this (together with the proper arrangement of the latrines) rests the very foundation of school morals. Health, discipline, tidiness, respect for personal property are all encouraged at this point—on the very threshold of each school day—by effective arrangements, or discouraged by the reverse. There should be a separate cloak-room for every 150 scholars, with, if possible, ingress at one door and egress at another. The cloak-rooms should not be altogether at one part of the building, but each should be as near as possible to the classes to which it is assigned. In this way perfect order can be maintained at assembly and dismissal, and the buildings be cleared of scholars at the end of each school session in a few minutes. The fittings of the cloak-rooms should be designed in order (1) to isolate each scholar's outdoor clothing, so that the risks of the spread of infection may be largely diminished, and that the wet coat of one boy may not saturate the dry coat or stain the light coat of his neighbour ; (2) to provide a system of umbrella-drainage, by which the fetid and discoloured drippings of many (cheap) umbrellas may be at once carried outside the building ; (3) to subject each separate coat and umbrella to a current of hot air, and, at the same time, to obtain such a length of hot-water pipes as will raise the temperature of the room sufficiently to dry wet clothes in the interval between assembly and dismissal ; (4) to reduce to a minimum the temptation to pilfer ; (5) and, by giving each boy's umbrella a place for deposit in his own compartment, to prevent delays and confusion at dismissal, and to check changes of ownership, accidental or otherwise. All these objects can be accomplished by fitting the cloak-rooms with wooden partitions round the walls, and additional back-to-back partitions projecting into the room at equal distances at right angles to one of the walls. Hot-water pipes should be carried round and under all the partitions, so as to create a current of air direct up to and through each coat as it hangs. The following detailed dimensions are given : Height of partition, 5 ft. 4 in. ; width, 1 ft. 2 in. ; depth, 8 in. ; height of ledge

for gaiters, 1 ft.; height of hook for umbrella, 2 ft. 6 in.; width of drainage-trough, 3 in.; length of hot-water pipes for 150 partitions, about 150 ft.

Drainage-troughs. — On an asphalted floor these should be formed by sinking runnels in the asphalte. On a wooden floor the side troughs should be made by two beads cased with zinc, and the main trough should be sunk in the boarding of the floor, and also cased with zinc. The main channel should communicate with the outside drainage. The lower panels of the door of the cloak-room should be fitted in with perforated zinc, in order that a current of colder and drier air from the corridors may be kept up through the room, to carry off the vapour arising from the wet clothes when heated by the hot-water pipes. The cost of the above need not exceed 6*s.* per scholar. *See* Robin's *Technical School and College Building*: Whittaker

Aristotle or **Aristóteles**, the famous Greek philosopher and teacher, was *b.* 384 B.C. in the colonial town of Stageira, and hence is frequently spoken of as the 'Stagirite.' His father, Nikomachus, was a physician, and a friend of Amyntas II. and Philip, King of Macedon, the grandfather and father of Alexander the Great. Having lost his parents very early Aristotle was brought up by Proxenus of Atarneus, in Asia Minor, to pursue medicine and surgery as a profession; but in his eighteenth year he went to Athens, and somewhat later became a pupil of Plato, who was so impressed with Aristotle's mental powers that he called him 'the intellect of the school.' Aristotle remained twenty years in Athens, where he established a school of rhetoric, or oratory, a kind of educational institute in which the youth of Athens obtained the mental training fitting them for the public life of their day. On the death of Plato (347 B.C.) Aristotle removed again to Atarneus, and subsequently to Mitylene, and it was about this time he was invited by King Philip to educate his son. In the period 343 to 340 B.C. Aristotle acted as tutor to Prince Alexander from the thirteenth to sixteenth year of the age of the latter. The young prince became greatly attached to his tutor, but they subsequently became estranged, owing to Alexander's ambition; and, on Alexander entering upon his great campaign in Asia (334 B.C.), Aristotle removed again to Athens. Here, at the age of fifty, he opened the 'Lyceum' (*q.v.*), so called from its being near the temple of the Lyceian Apollo (Apollo Lyceius). It was while at this school that Aristotle matured his philosophy and attained his unsurpassed reputation as a philosophical writer and teacher. From his habit of walking about the garden of the Lyceum with his pupils when teaching, his was called the peripatetic philosophy (Greek, *περιπατεῖν*, to walk about). In this congenial occupation he passed twelve years; but in 322 B.C., after Alexander's death, Aristotle had to fly from Athens, his enemies having brought against him an absurd charge of godlessness or atheism. He died the same year at Chalcis in Eubœa, at the age of sixty-two. One of the greatest achievements of Aristotle was the creation of the science of deductive logic, which has undergone no material modification since it left his hands. His other writings embrace all branches of speculative philosophy—i.e. metaphysics, or the science of real being; ethics, or the science of morality; and politics, or the science of government, and social science; these, and his treatises on rhetoric and poetry, on animals, and various other subjects, are amongst the greatest monuments of the human intellect. Aristotle, being himself a teacher by profession, also wrote upon education, considered from the point of view of general ethics, as well as in its social and political relations. If man is to attain the greatest human good, happiness, he must, according to Aristotle, be trained to the knowledge and practice of virtue—in the first place to theoretical or diagnostic, and in the second place to practical or ethical virtue. Having to live in a material world, however, man must not be allowed in his education to neglect the useful, but he must pay attention to this only within due limits, so that he does not become absorbed in the pursuit. As virtue is a regular habit or attitude of the soul, and not simply a capacity, human beings can only acquire it by proper teaching, training, and habituating in its ideas and practice. According to Aristotle, the guidance of the business of education is the duty of the State. The first thing necessary is to take care that infants shall be properly fed, and that they shall be brought up with healthy bodies. Up to their fifth year children should be provided with amusement, and

their play should be so guided as to develop more particularly their muscular system. From the fifth to the seventh year the child should receive oral instruction, listening to the words of his teacher, and looking at objects or other modes of illustrating the oral lessons. From the seventh to the fourteenth year the boy goes through the elementary course of education at school, and from the fourteenth to the twenty-first year the advanced course at the higher school and academy, coming out at the end a man fully developed mentally, morally, and physically. The leading departments in the education of the ancient Greeks were called (1) grammar, (2) music, and (3) gymnastics, answering respectively to (1) literary, (2) æsthetic, and (3) physical culture. On all these points there are many valuable observations to be found in Aristotle's various treatises. It was characteristic of Greek civilisation that Aristotle should teach that deformed and hopelessly weak infants should not be permitted to live. Nor did Aristotle allow that slaves, or even women, had the capacity of being fully trained to virtue. Wisdom is the highest object of the highest education, but this, according to Aristotle, was unattainable until man had reached the pitch of culture entitling him to be called a philosopher. (*See* ATHENIAN EDUCATION.)

Arithmetic (Gr. *ἀριθμητική*, from *ἀριθμός*, number) is the science of the expression of number by symbols, and the application of rules relating to them. These symbols are called numerals. The earliest known system of numerals was that of the Egyptians. In their hieroglyphs the digits up to nine are simply strokes (III = three, and so on), ten is ∩ up to a hundred, thus thirty-one is written ∩∩∩I; the signs for hundred and for thousand are also distinct. Now here there is not the remotest attempt to assign value to *position*. Following this earliest form we find the hieratics, and the enchorials or demotics. These have been traced out with marvellous skill by Champollion the younger. If we look at the Roman method of notation, it seems difficult to say that I, II, &c., did not arise in this simple way of repetition. The Hebrew, Greek, and Latin systems each employed letters. The Arabic numerals, which have had so much to do with the progress of arithmetic in the Western world, appear to have been known to the Hindoos as early as the fifth century. They were certainly introduced by the Arabians into Spain, though the precise date is not known. Gerbert, afterwards Pope Sylvester II., who died 1003, is said to have carried these numerals from the Moors of Spain into France, 960; and they were known in England early in the eleventh century.

It is supposed that the Greeks and Romans at first used pebbles as counters, and the very word 'calculation' points to the calculus or small stone as employed for counters. In confirmation of this are the facts that the Indians are very expert in reckoning by means of their fingers, without pen and ink; the natives of Peru will, in making calculations by an arrangement of maize grains, surpass in speed Europeans aided by many rules. The Chinese, too calculate by means of balls on rods, which they manipulate with such amazing dexterity that the most intricate exchanges are calculated in their banking-houses in the shortest possible time. In our own country also Napier's rods and Babbage's calculating machine were once familiar. Even in the reign of Charles II. Sir Samuel Morland invented two machines which he called 'arithmetic instruments,' and from his book it would seem that the fundamental rules can be easily worked, as he says, 'without charging the memory, disturbing the mind, or exposing the operations to uncertainty.' About 1780 Earl Stanhope invented two machines which perform the operations of multiplication and division with remarkable accuracy. It is probably owing to the mechanical habit of our primitive ancestors of counting on the five fingers of each hand that we owe the discovery of the decimal system of notation, because, as Mr. Peacock observes, 'Natural scales of numeration alone have ever met with adoption,' meaning by natural scales those adopted from the hands or from the hands and feet. These methods we call quinary (by fives) or vicenary (by twenties). This is further seen by their name, the simple symbols of numbers being in Latin called digits, or *fingers*. The Caribbees call the number 'ten' by a phrase which means 'all the children of the hand' (Peacock, p. 390). So that we can well understand Mr. Peacock's statement that 'amongst all nations practical methods of numeration have preceded the formation of numerical language.'

But no mechanical device has been at once so simple and so effective as the in vention of a local value for figures, i.e. the fixing the first line for units, the second for tens, the third for hundreds, &c., so that 444 does not stand for three fours simply, but for four units, four tens, and four hundreds. This now appears so simple to us from long practice that it seems scarcely possible for it ever to have been otherwise. But if we remember that the Greeks used letters for their arithmetic, and yet had fraction sums, we see how very cumbersome such a system must have been. Apparently this invention of local value is quite recent. The Egyptians sometimes arranged their 'straight strokes' in two columns to save space, but, as we have said, they had no idea of local value, neither had any other nation of antiquity. Pythagoras, who lived from 570 to 504 B.C., is reported to have invented the multiplication table—the Abacus Pythagoricus—but there seems no trace of the Greeks having advanced in any real science of arithmetic beyond the Egyptians from whom they received it. Diophantus, an Alexandrian, who flourished about the beginning of the Christian era, made a remarkable advance in arithmetic by the discovery of the indeterminate analysis, a species of algebra, on account of which he is called the inventor of algebra. Six books of his, in Greek, were published on arithmetic. Beyond this step there is little to record for the first six centuries in the Christian era, and in the middle of the seventh the Mohammedans practically swept away philosophers with their books and their inventions. It is, therefore, striking to find the means of mathematical progress coming from these same Arabs, as we have seen above, by furnishing the Western world with a system of numerals which offered every facility for ready combination. But even this system must have remained practically inoperative, but for the invention of local value. And here it is interesting to note that towards the discovery of local value the most important step was the invention of the cipher. 'Cipher' is from an Arabic word meaning vacant, and in the old systems they had not a symbol for vacuity. The absence of this symbol probably prevented them from arriving at the notion of local value, for without it any numbers written in columns would constantly be deranged. And of course, in the case of letters where the value of each was absolute, there was nothing to suggest such a contrivance as local value. After its discovery there were several courses open, and we might have had a binary, quinary, or duodenary scale instead of our decimal notation. We have already referred to the probable cause of a system of tens being adopted, viz. that the fingers on both hands form such a ready reference and easy explanation in cases of early counting. This will not sound strange if we bear in mind that there are tribes who have never risen to a quinary scale because they have never wanted numbers as high as five. Aristotle mentions a tribe of Thracians who never counted higher than four. Darwin quotes Sir John Lubbock (*Descent of Man*, p. 180), and remarks how improbable it is that our earliest ancestors could have 'counted as high as ten,' considering that so many nations 'now in existence cannot get beyond four.' If we add to these facts the part the fingers played in the earliest mathematical investigations of most of us, we shall be prepared to admit that the decimal system may have been suggested by a natural arrangement.

The essence of our present 'decimal notation' is that, in a row of figures proceeding to the left, each column increases the value of the figures tenfold. We trace the origin of this system to the Hindoos, and they ascribe to it a divine source. The date of its introduction into Europe is not clear. We have already referred to the statement respecting Pope Sylvester II., which is doubted by many. The more probable account is that Leonard of Pisa introduced it in 1202 in a work entitled *Liber Abbaci*, &c. Others have supposed that the Alonsine tables (or Alphonsine tables, constructed by the Moors at the court of Alonso) first contained this system. Certain it is that the system was in the hands of the Persians and Arabs before the twelfth century, and that they ascribe it to the Hindoos. There seems to have been no general use of Arabic numerals in Europe before the invention of printing, and the works of Caxton do not contain them except in woodcuts. Merchants continued to keep their accounts in Roman numerals till the sixteenth century.

The next great step in arithmetic was the discovery of compound proportion and

decimal fractions in the sixteenth century.

Modern Processes and Methods of Teaching.—The teacher of arithmetic has constantly to bear in mind the double purpose for which it has to be taught, viz., as an intellectual discipline, and as a series of processes required in the business of life. The two purposes are in no way conflicting, and both may be secured in every detail at the same time. Let us ask, What are the principles enforced by the consideration of arithmetic as an intellectual discipline?

I. Firstly, the reasons for rules and processes, and the relations of different rules and processes, should be clearly laid out. It has come to be an axiom in the schoolroom applicable to all parts of arithmetic that it is never necessary to teach rules of 'thumb,' or to give any rule for use without the explanations of the principles on which it is based. For example, in the reduction of a circulating decimal to a vulgar fraction, there is great temptation to be content with the simple rule, but the temptation has to be resisted. We must, of course, learn how to write the required result at sight, but we should also learn how to prove the rule. When the repeating series commences immediately after the decimal point, for instance, the *Rule* runs as follows:—Make the recurring figures the numerator of a fraction, and place underneath it as many nines as there are digits in this numerator. When the repeating series does not commence immediately after the decimal point the *Rule* usually runs as follows:—Set down all the figures from the decimal point to the end of the repeating series, and subtract the figures which do not repeat. Make the difference the numerator of a fraction, and for the denominator place as many nines as there are figures in the repeating part, and as many ciphers as there are figures in the part which does not recur. Now, the right method of teaching is to evolve the rules first from given examples. Three forms of illustrative examples will be required.

EXAMPLE I.—·6

Let V be the vulgar fraction required.

Then V = ·6666 &c.

As there is one repeating figure, multiply by 10.

Thus 10V = 6·6666 &c.

But V = ·6666 &c.

Subtract 9V = 6

and $V = \frac{6}{9} = \frac{2}{3}$.

EXAMPLE II.—54.

Let V be the vulgar fraction required.

Then V = ·545454 &c.

As there are two repeating figures, multiply by 100.

Thus 100V = 54·5454 &c.

But V = ·5454 &c.

99V = 54

and $V = \frac{54}{99} = \frac{6}{11}$.

EXAMPLE III.—·236.

Let V be the vulgar fraction required.

Then V = ·2363636 &c.

As there is *one* decimal before the first recurring period, multiply by 10.

Then 10V = 2·363636 &c.

As there are two repeating figures, multiply by 100.

Thus 1000V = 236·3636 &c.

and 10V = 2·3636 &c.

990V = 234

Hence $V = \frac{234}{990} = \frac{26}{110}$.

II. Secondly, where there is a choice of processes the needs of the science of arithmetic will lead to those being selected which will tend to connect rules together, and which have most applications in the advanced parts; for example, it may seem at first sight a matter of very small import whether in simple multiplication we begin with the figure on the right-hand side or the figure on the left; but the importance is vastly increased when other rules of arithmetic and of algebra are considered. We shall give a few of the advantages to be gained by beginning with the figure on the left-hand in preference to that on the right. (i.) It is the natural order of thought and language. We say 300 and 50 and 5, not 5 and 50 and 300. (ii.) The reason for the rule is more easily explained. Thus, taking the case of the following example—

3758604	—multiplicand
425	—multiplier
15034416	—400 times
7517208	— 20 „
18793020	— 5 „
1597406700	—425 „

the multiplier 425 is made up by taking 4, then multiplying this by 10, and adding 2, thus making 42, and then multiplying this by 10 and adding 5, making 425. If we remember that to remove all the figures one space to the left is to multiply the whole number by 10, we may describe the method as follows:—Multiply by the left-hand figure, then multiply by 10 and

add the product of the next figure, multiply again by 10 and add the product of the next figure; and so on. (iii.) The same method may be applied in compound multiplication of either money, weights or measures, and the reasons for the steps are there made more apparent; suppose, for instance, that 2*l*. 11*s*. 9½*d*. is to be multiplied by 425, we multiply first by 4, then by 10 and add in twice the top line, then again by 10 and add in 5 times the top line. (iv.) The process is identical with that of building up such an expression as $ax^n + bx^{n-1} + \text{etc.}$, which is the foundation of all methods of approximation to the roots of equations. (v.) In the multiplication of decimals to a given degree of approximation there is a very decided advantage in proceeding with the figures of the multiplier from left to right, and if we adopt this order from the beginning, no change is afterwards needed and much explanation is therefore saved.

Precisely similar reasons to those here given for the order of multiplication occur again and again throughout arithmetic. For instance, the old rules for square and cube root, which depend on the form of the expansions of $(a+b)^2$ and $(a+b)^3$, should give way to Horner's method, not only because this method is so simple and so much more easily remembered by beginners, but chiefly because the rules of square and cube root are thus presented as only two forms of the same general process which is applicable to the extraction of any root.[1]

[1] As this method is not generally known, it may not be out of place here to give an example of it. Let it be required to find the cube root of 277,167,808. Divide the number into periods of three figures in the usual way.

Make three columns, and letter them from left to right—I., II., III. Place the given number under I. and 0 under II. and III., putting 1 in a column by itself in front. The column on the left (III.) is the column of *three operations*, the next that of *two operations*, that on the right of *one operation*.

The operations consist in multiplying the amount in the preceding column by the figure in the quotient, and adding in the cases of all columns but I.—subtracting under I. :—

	III.	II.	I.
1	0	0	277,167,808(652
	6	36	216
	6	36	61
	6	72	
	12	108	
	6		
	18		

III. Thirdly, both the purposes for which arithmetic is taught dictate the desirability of looking upon all sides of a question, and not restricting the number of ways in which it may be solved. For example, the use of the Rule of Three by the unitary method does not exclude the need of the Rule of Proportion, or make the Chain Rule unnecessary.

IV. The second of the purposes for which arithmetic is taught, viz., for its use in mercantile affairs, adds some lessons of its own. Speed of working must be obtained, and as the mind can reckon quicker than the hand can write, this consideration forbids the writing of unnecessary figures. Thus, in long division the method is shortened, and also the wording, by

By trial we find the first figure 6. Place 6 times 1 under III. and add, 6 times 6 under II. and add, 6 times 36 under I. and subtract. Repeat under III. and II., and again under III.

Add 0 to 18 under III., 00 to 108 under II., and bring down the next period under I. Proceed for the next figure in the same way. To find what the next figure will be, treat the number under I. as dividend, and that under II. as a trial divisor. This gives 5 :—

	III.	II.	I.
1	180	10,800	61,167
	5	925	58,625
	185	11,725	2,542
	5	950	
	190	12,675	
	5		
	195		

Make addition of 0, 00, and next period, and proceed as before. The trial of 1,267,500 into 2,542,808 suggests 2 as next figure :—

1	1,950	1,267,500	2,542,808
	2	3,904	2,542,808
	1,952	1,271,404	

We need not complete III. and II., for evidently—

By avoiding unnecessary figures, the process appears thus:—

	III.	II.	I.
1	0	0	277,167,808(652
	6	36	61,167
	12	10800	2,542,808
	180	11725	.....
	185	1267500	
	190	1271404	
	1950		
	1952		

In square root there are columns of II. and I. operations only; in extracting the 5th root there would be five columns; but in all other respects the operations are the same.

leaving out from the working the various products, writing down merely the successive differences. In order to affect this subtraction should, from the first, be regarded as the inverse operation to addition; that is, the difference should be obtained by thinking what number must be added to the less to make the greater. Also in finding the G.C.M. of two numbers the process is really a series of divisions made for the sake of obtaining a series of remainders. It is usual to avoid re-writing one of the two numbers by arranging the operations in a snake-like form; but the saving may be carried much further than this, for we get a more compact form if we place the quotients alternately on the right-hand and on the left according as the divisor is on the left or on the right of the dividend. Thus, to find the G.C.M. of 3330 and 8415.

	3330	8415	2
		6660	
1	1755	1755	
	1575	1575	1
8	1440	180	
	135	135	1
3	135	45	

If to this we apply the contracted method of division referred to above, we write only the essential numbers, namely, divisors, dividends, and remainders. This gives the contracted form as follows:

1	3330	8415	2
		1755	1
8	1575		
		180	1
3	135		
		45	

V. Nearly all measurements are approximations only, and the degree of approximation required in mercantile transactions must be borne in mind, and no more figures should be introduced into the process than are needed to produce the necessary degree of accuracy. The want of attention to this rule in schools is the cause of the contempt which business men often express for school arithmetic. For example, a boy is asked a question, 'How much stock at 92½ can be purchased for 1,500*l.*?' The answer is given by the school-boy, 1,628*l.* 4*s.* $5\frac{2}{13}\frac{9}{7}$*d.*; and nine-tenths of the figures of his working are required for the finding of the impracticable fraction only. In purely mercantile questions it should be remembered that it is useless to calculate sums to be paid or received to a greater degree of accuracy than the nearest farthing; that no more figures should be used than are necessary to give the required answer to that degree of accuracy; that reduction upwards to decimals of a pound rather than reduction downwards to pence is to be preferred; and generally that it is a disadvantage to increase the number of figures representing a given quantity. Thus 2*l.* is more easily dealt with than 480 pence; 2 miles is a more convenient measure than 3,520 yards. Hence change pence to pounds rather than pounds to pence, and generally take it as a rule that there is an advantage in changing units of a lower name for equivalent units of a higher name as soon as possible, while, on the other hand, there is a disadvantage in changing the higher units for the lower before it is absolutely necessary to do so.

This consideration shows the value of decimal arithmetic with contractions and approximations. A little practice enables a person to write a given sum of money at once either decimally or in ordinary coinage without any process of reduction, and this facility may frequently be used to turn to decimals quantities expressed in the usual weights and measures. For instance, if it be required to turn tons, cwts., qrs., lbs., to the decimal of a ton approximately: since 1 cwt. is the same part of 1 ton as one shilling is of 1*l.*, and one quarter the same part as 3*d.*, we may write the decimal by taking

2 cwt. as 1 florin, or ·1;
1 cwt. as ½ florin, or ·05;
1 qr. as 3*d.*, or ·0125;
2¼ lbs. as 1 farthing, or 1 mill., or ·001.

Therefore, to find the value of 4 tons 11 cwt. 3 quarters, at £2 14*s.* 9*d.* per ton:—

4 tons 11 cwt. 3 qrs. like £4 11*s.* 9*d.* = 4·5875; £2 14*s.* 9*d.* is 2·7375:

4·5875
2·7375
9175
8211
138
82
2
12·558

Answer: £12 11*s.* 2*d.*

Mental arithmetic is an art of such wide utility, that it has long formed an important branch of arithmetical

teaching in elementary and secondary schools.

To sound progress in mental arithmetic a thorough grounding in the first and simplest elements of the science is indispensable. The teacher, for instance, who follows the course recommended by Professor de Morgan in training scholars quickly to count backwards and forwards will carry his pupils forward with far greater ease than one who fails to pursue this method. De Morgan, in fact, strongly advises every student of arithmetic to pursue the practice of counting arithmetical series.

Mental arithmetic, in the narrower sense of the term, is a practical art. It consists of a *body of rules* for the rapid working (without the aid of writing) of problems involving chiefly the ordinary weights and measures and divisions of money. As these are all purely conventional, there is no problem involving them that can be worked mentally, except by pupils who have thoroughly committed the tables to memory. Where, as in France, such tables are throughout on the *decimal system*, the figures give the pupil no trouble to learn. He knows them as soon as he has learnt the common multiplication table up to 10 times 10, and there is nothing further whatever of a numerical nature to learn in decimal weights and measures except mere names. Among the Continental nations, therefore, mental arithmetic is incomparably easier than with Englishmen. Our tables of weights and measures are an anachronism. Compared with the decimal tables, the English weights and measures are as clumsy, unphilosophical, and unscientific as is the Roman system of notation compared with the Arabic. They necessitate an enormous amount of otherwise absolutely unnecessary labour, and multiply the difficulties of mental and ordinary arithmetic a hundredfold. Under the decimal system there are no compound rules of arithmetic. The rules of mental arithmetic in English schools are consequently enormously more complicated than in most Continental schools.

Army Schools. *See* EDUCATION FOR THE ARMY.

Arnauld, Antoine. *See* JANSENISTS and REFORMATION.

Arnold, Matthew. *See* PEDAGOGY, INSPECTORS, and ROYAL COMMISSIONS.

Arnold, Thomas, D.D., made a great reputation as a teacher by the success with which for the last fourteen years of his life he discharged the duties of head-master of the great public school of Rugby. Arnold was the son of a collector of customs at West Cowes, Isle of Wight, where he was born on June 13, 1795. Losing his father while still a child, he received a careful preparatory education from his mother and aunt, and after spending four years (1803 to 1807) at Warminster School, Wiltshire, entered the public school of Winchester, where he remained from 1807 to 1811, under the successive head-masters Dr. Goddard and Dr. Gabell, of whom he speaks with gratitude as excellent teachers. In 1811 he became a student in Corpus Christi College, Oxford. He was elected Fellow of Oriel in 1815, and won the Chancellor's prize for a Latin and an English essay in 1815 and 1817. At this period Thucydides -- whose history of the Peloponnesian War he at a later period edited with valuable notes and commentary—Aristotle, and Herodotus were his favourite authors; but his studies embraced not only classics and history, but an earnest investigation of the Christian Scriptures, and the great principles of religion and philosophy in their application to daily life. Entering on these problems, somewhat unsettled in his opinions, Arnold, who was constantly discussing them with his contemporaries at college, including men like Keble, Whately, Copleston, Davison, and Hampden, ended by becoming thoroughly imbued with the Christian spirit, convinced that the noblest life was to be found in the Christian ideal—in the endeavour to live in the spirit of Christ. It was to the fact that he was himself profoundly penetrated with the religious spirit that his success as a teacher was due. Having taken deacon's orders in 1818, he settled in 1819 at Laleham, near Staines, where he was for some time chiefly engaged in preparing young men for the university. He was elected to the head-mastership of Rugby School in 1828. In one of the testimonials given to Arnold on becoming a candidate for this position, the writer used the prophetic words: 'if Mr. Arnold is elected he will change the face of education through all the public schools of England'—a prediction quite justified by the issue. Arnold's distinc-

tion as a teacher was not that he invented any new form of discipline. His success was wholly due to his own earnest endeavour to apply the principles of Christianity to life in the school as well as out of it. The mere fact of his own genuine devotion to Christian principle had an irresistible influence with the boys under his care; the amiability of his heart, the justice of all his dealings with them, the transparent honesty of his own character, made him at once loved and feared. His method may be illustrated by the way in which he trained boys to truthfulness. In the higher forms of the school, if a boy, in replying to a question on some point of conduct, was not satisfied simply to give his reply, but attempted to support it by other statements, Arnold at once stopped him with the words, 'If you *say* so, that is quite enough. Of course I believe your word.' The feeling at once grew up in the school that it was disgraceful to tell the head-master a lie, and thus truthfulness became habitual. In this and other ways Arnold gained a complete mastery in directing the public opinion of the school—and there is no more powerful aid to discipline, no more effective instrument for controlling a company of boys as well as the society of men at large, than public opinion, or the general standard of moral conduct. Arnold could act with severity where he found it necessary. Once he made an example of several boys by expelling them from the school for gross breaches of truthfulness and order, and, in doing so, he said, 'It is *not* necessary that this should be a school of three hundred, of one hundred, or even of fifty boys. It *is* necessary that it should be a school of Christian gentlemen.' In June 1842 Arnold was suddenly cut short by an attack of *angina pectoris* at the early age of 47. Besides his labours in the school Arnold was a prolific writer. In addition to his edition of Thucydides, he wrote a *History of Rome*,' in three volumes, a work based on the then popular sceptical theories of Niebuhr. He also published five volumes of sermons, and contributed numerous articles to the encyclopædias, reviews, and periodicals of the day. In 1841 he was appointed by Lord Melbourne to the Professorship of Modern History in the University of Oxford. He only lived to deliver one short course of lectures, which were attended by numerous audiences, and were published after Arnold's death. *See* Stanley's *Life and Letters of Thomas Arnold.*

Art Education. *See* ÆSTHETIC CULTURE and SCIENCE AND ART DEPARTMENT.

Arts (Liberal).—Art is derived from the same root as *aro*, to plough, because ploughing was the first art (Max Müller); or more commonly from a root *ar*, meaning to fit things together. In itself it is a wide term often used to denote everything not a direct product of nature, and in this sense we speak of nature and art. In a more restricted sense it is opposed to science on the one hand, and to manufactures on the other. Its meaning is made fairly clear in the old definition that 'Science is to know that I may know; Art is to know that I may teach.' There is a more limited sense still, including a group of arts, whose end is not use but pleasure. These are called the fine, the liberal, or the polite arts—'liberal' here meaning only such as the leisured classes (freemen as opposed to slaves) could follow. These are sometimes spoken of as art, as if they only were the arts. By common consent the five principal fine arts are—architecture, sculpture, painting, music, poetry (*See* ÆSTHETIC CULTURE.)

Ascham, Roger, *b.* 1515.—One of the earliest of English educational reformers, whose claim to that distinction is established by the new method of teaching he unfolded in his celebrated *Scholemaster* published in 1570, two years after his death. This work, in the opinion of Dr. Johnson, 'contains perhaps the best advice that was ever given for the study of languages.' Ascham advocates the adoption of the natural in preference to all artificial methods, and maintains that the dead languages must, like mother tongue, 'be gotten, and gotten only by imitation. For as ye used to hear, so ye used to speak.' He expresses his willingness to venture a good wager that an apt scholar who will translate some little book in Tully on the frequent repetition method, will in a very short time learn more Latin 'than the most part do that spend from five to six years in tossing all the rules of grammar in common schools.' Like Locke, Ascham spoke from successful experience as a private tutor, and he tells us that his illustrious pupil Queen Elizabeth, 'who never took yet Greek nor Latin grammar in her

hand after the first declining of a noun and a verb, but only by this double translating of Demosthenes and Isocrates daily, without missing, every forenoon, and likewise some part of Tully every afternoon, for the space of a year or two, hath attained to such a perfect understanding in both the tongues,' as to be a more remarkable example of the acquisition of great learning and utterances than even Dion Prussæus, whom Ascham instances as having accomplished this feat with the assistance of only two books, the *Phædo* of Plato and the *de Falsa Legatione* of Demosthenes. Roger Ascham was a native product of the new learning of the sixteenth century which marked the decline of monkish Latin and the rise of a more liberal scholarship with the introduction of Greek into the school curriculum. Ascham publicly read Greek at Cambridge in 1536, published *Toxophilus, the Schole of Shootinge*, 1545, and was Latin secretary to Edward VI., Mary, and Elizabeth. For ten years previous to the accession of Elizabeth he was her preceptor.

Assimilation. *See* DISCRIMINATION.

Association of Ideas.—This expression refers to the well-known laws which govern the succession of our thoughts. Whenever one thing reminds us of another, this process of suggestion is due to a law of association. The first and principal one, known as Contiguity, tells us that ideas recur to the mind in the order in which the original objects and impressions presented themselves. In this way we associate events that occur together or in immediate succession, as the movement and sound of a bell, objects and events with places, one place with another, and so forth. All acquisition of knowledge, whether by direct observation or through the medium of instruction, involves the building up of a group of such associations. Thus, a child's knowledge of a particular animal includes associations between the several characteristic features, between the animal as a whole, and its proper surroundings, its habits of life, &c. In studying geography and history, complex associations of place and time have to be built up. Since, moreover, all verbal acquisition implies the working of this law, both in the coupling of names with things and in the connection of words in a given order, it is evident that the whole process of learning is concerned to a large extent with the fixing of associations in the mind. In addition to the law of Contiguity, it is customary to specify two other principles governing the succession of our ideas, viz. Similarity and Contrast. It is a matter of common observation that natural objects, persons, words, &c., often recall similar ones to the mind. Here, however, it is evident that the connection is not due to the fact that the things were originally presented in this order, but rather to the action of the mind in bringing together what is similar. This law has an important bearing on the process of acquisition (*q.v.*). By discovering points of resemblance between new facts and facts already known, we are able greatly to shorten the task of learning, as is seen in the rapidity with which an accomplished linguist masters a new language. All assimilation of new knowledge evidently involves the working of this principle, since it proceeds by joining on the new acquisition to old ones which are seen to have some analogy or affinity to the first. The law of Contrast, which says that one idea tends to call up its opposite, as good, bad, seems to be by no means universal in its action, and is not a principle co-ordinate in independence and dignity with the other two. So far as it is valid, it represents a tendency of thought which springs out of the essential conditions of our knowledge of things. We begin to know common objects by distinguishing one thing from another, and the broader differences or contrasts among things are among the first to impress the childish mind. In this way a child learns to think of opposites together, as sweet sour, good naughty. The well-known effect of contrast on the feelings renders it a valuable instrument for giving greater vividness to impressions, and so stamping them more deeply on the mind. The contrasts of climate, scenery, social condition, and so forth, are a great aid in the more descriptive and pictorial treatment of geography and history. (For a fuller exposition of the laws of association *see* Bain, *Mental and Moral Science*, bk. ii. chap. i.–iii.; Sully, *Teacher's Handbook*, chap. ix.; and Spencer's *Principles of Psychology*, i. 228.

Assyria (Schools of). *See* SCHOOLS OF ANTIQUITY.

Astronomy (ἄστρον, a star, and νόμος, a law) is the science of the heavenly bodies. It does not form an adequate part of the

course of general instruction in this country, though some of the elementary parts are included in the higher standards of the Educational Code. Yet it is a subject that can be made highly interesting to children, and requires little expenditure in the way of apparatus. Every child can be brought to observe that the heavenly bodies appear to move from east to west around the earth, and can thence be led to conclude that the earth rotates from west to east. Then they can be easily interested in noticing that most of the heavenly bodies keep their relative positions with respect to each other, but that some do not, viz. the sun, moon, and planets. How pleased are children when they can point out any of the constellations, as Orion or the Great Bear, or any remarkable star, as the Pole Star. By drawing their attention to Venus—now rising before the sun as the morning star, now setting after it as the evening star, gradually moving until a short distance from it, then standing still, then drawing nearer—they can be shown that Venus must most probably be moving around the sun at a less distance from it than we are. Again, from the apparent motion of the sun amongst the stars the real motion of the earth around the sun can be made known. This will lead to a general description of the solar system. Then the earth can be more particularly dealt with—its globular shape demonstrated, its meridian and other lines explained, the method of denoting the positions of places by latitude and longitude made known—as well as the way to determine its dimensions by measuring a small part of a meridian. Afterwards the phenomena of day and night and of the seasons can easily be explained with the help of a small globe. Most interesting is the explanation of the phases of the moon. Eclipses of the sun and moon should not be allowed to pass without the attention of the children being drawn to them and their causes being shown. These phenomena may also be made of use to show that all the heavenly bodies are not at the same distance from us, and also that the earth and moon are spherical. As far as this only the naked eye, protected at times by a piece of coloured glass, is required for observation; but if a telescope were among the school apparatus what further subjects for thought would be opened out to the pupils!—Jupiter's moons, Saturn's rings, the surface of the moon, the spots on the sun, the different clusters of stars. All this can be made to draw out a child's powers of observation and to lead him to right conclusions.

Nautical Astronomy is taught to merchant-seamen at schools and training-ships at most of the principal ports, and to the Royal Navy at the Greenwich School, on board the 'Britannia,' and at the Royal Naval College. It also forms one of the subjects of examination by the Science and Art Department. The pupils are taught to measure with the sextant the altitudes of the heavenly bodies, noting the times by the chronometer, and from the data thus obtained to work out the latitude and longitude of the place of observation. In England lectures on *Mathematical Astronomy* are delivered at the universities, and there are observatories where the students may learn to use the different instruments; but the numbers making use of these opportunities are very few. In the universities, colleges, and high schools of the United States, however, this advanced study is very general.

Athenæum.—The name given to a temple at Athens dedicated to Athena. In it poets and scholars were accustomed to meet and read their productions. Used in the present day to designate a scientific association, or the building where such an association meets. A school of higher grade in Holland and Belgium is called an Athenæum.

Athenian Education.—From times beyond the records of history, the first impressions of Athenian children must have been derived from the tales and sayings of their mothers, nurses, and other attendants. 'Know you not,' says Socrates in the *Republic* of Plato, 'that first of all we teach children fables?' In particular, the basis of their moral and religious feelings must have been strongly laid by the narration of legends regarding the marvellous actions of gods and demigods; and these were handed on from generation to generation, not least effectively in the shape of ballads. Plato, in the organisation of his model Republic, was much concerned that there should be a safe selection of such educational instruments in the plastic days of early youth. 'First of all then, as it seems, we must exercise control over the

fable-makers; and whatever beautiful fable they may invent we should select, and what is not so we should reject; and we are to prevail on nurses and mothers to repeat to the children such fables as are selected, and fashion their minds by the fables much more than their bodies by their hands. But the greater number of the fables they now tell them must be cast aside.' Homer and Hesiod, and the other poets, would therefore require to be severely expurgated. Plutarch, also, was in favour of restraining nurses from telling children fables indiscriminately, on account of the ruinous moral effects. Aristotle would place these matters under the supervision of the Pædonomi, or magistrates who exercised a certain superintendence over the education of youth. The fables of Æsop appear to have stood highest in popular esteem. Æsop was a contemporary of Solon, and lived about 570 B.C. By the opening of the fourth century before the Christian era—a date rendered ever memorable by the death of Socrates—there seems to have been widely diffused over the Grecian world a certain amount of elementary education. At what age children commenced going to school we are not definitely informed; Plato and Aristotle agree that there was no good in attempting formal mental instruction before the age of five. At the end of the sixth year, boys and girls were separated. The children were conducted to school, to the gymnasium, and indeed everywhere out of doors, by a private tutor, or pedagogue (*παιδαγωγός*, child-leader)—a slave usually, who did not necessarily possess much knowledge or polish, and who generally carried the boys' books, musical instruments, and other school necessaries, and governed their conduct by the conventional rules of propriety. At the gymnasium, the pedagogue attended his pupil all the time he remained there; but it is hardly probable that he stayed in like manner at school during school hours. Indeed, about the middle of the fourth century B.C. there was a law forbidding persons over school age (except the son, or daughter, or son-in-law of the schoolmaster) to enter the school during school hours, on pain of death; but this law appears to have been abrogated soon afterwards. When a youth entered on his seventeenth year, the occupation of his pedagogue was gone. The literary education of youth was in no way controlled by the State, but depended on the opinion and discrimination of the parents. 'Did not the laws enacted on this point,' asks Socrates in the *Crito*, 'enjoin rightly, in requiring your father to instruct you in music and gymnastic exercises?' But these laws seem to have been practically in abeyance. Public institutions, maintained at the expense of the State, do not appear to have been founded till a late period; and although Plato talks of appointing teachers, to be paid at the public cost, this was only his own speculation, to which there was no corresponding actuality for long afterwards. Still, the idea of education strongly commended itself to the public mind. The total neglect of the education of one's children was exceptional, and disapproved; Plutarch relates how the people of Trœzen not only supported Athenian fugitives, women and children, at the time of the Persian invasion, but also paid teachers for the children; and Ælian tells us that the Mitylenæans thought they inflicted the severest possible penalty on their revolted allies when they prohibited the education of their children. But there was no real State intervention to secure a good quality of education. The teachers followed the profession, not because they were specially qualified, but because it offered a fairly ready means of livelihood; and the Pædonomi limited their superintendence to the administration of certain laws respecting morality. The profession of elementary schoolmaster, indeed, was not in high repute. School opened early in the morning. Solon enacted that the schools should not open before sunrise, and should close before sunset. There was certainly an afternoon meeting. The great branches of instruction were—*grammata* (*γράμματα*), *mousikê* (*μουσική*), *gymnastikê* (*γυμναστική*); Aristotle gives a fourth, *graphikê* (*γραφική*, drawing or painting). *Γράμματα* may be taken as including reading, writing, and arithmetic. In reading, the pupils were first exercised on syllables, then on the component parts of the sentence, after which they commenced reading, properly so called. In writing, copies were set by the teachers. In arithmetic, the fingers were freely employed, or apples or counters were used for concrete presentation. When the pupils were able to read with facility and intelligence, they were intro-

duced to the works of the poets, and committed to memory selected passages and even whole poems. The poems of Homer, in particular, were read and treasured in memory, as containing worthy sentiments and great examples, and as calculated to rouse the energies of youth and determine them to noble purposes. This study of Homer was long continued into later times.—Music was commenced later, about the thirteenth year. It was not a compulsory portion of the instruction of youth (there was no such thing as compulsory instruction of any sort), nor was it even regarded as essential, but it was considered to be a noble and liberal occupation for leisure moments. So says Aristotle. Grote, in describing the training of Epameinondas (*Hist. of Greece*, ch. lxvii.), says: 'He also learned music, vocal and instrumental, and dancing; by which in those days was meant, not simply the power of striking the lyre or blowing the flute, but all that belonged to the graceful, expressive, and emphatic management either of the voice or of the body; rhythmical pronunciation exercised by repetition of the poets—and disciplined movements, for taking part in a choric festival with becoming consonance amidst a crowd of citizen performers. Of such gymnastic and musical training, the combination of which constituted an accomplished Grecian citizen, the former predominated at Thebes, the latter at Athens. Moreover, at Thebes, the musical training was based more upon the flute; at Athens, more upon the lyre, which admitted of vocal accompaniment by the player.' The lyre and cithara —there can have been but little difference between them—were indeed the only instruments thought proper for a free citizen of Athens. The flute, although at one time a great favourite, was at length given up at Athens, partly because it distorted the features, partly because it precluded the player's own vocal accompaniment.—The exercises of the *Gymnasium* (*q.v.*) for the development and strengthening of the body were regularly entered upon at the age of sixteen, and continued till eighteen. Advanced instruction, beginning at eighteen or twenty, was given by the Rhetors and Sophists, *for pay*, mostly to the sons of the wealthier citizens; Socrates alone taught in the streets and the market-place with all who cared to discuss with him, and *without reward*. The special object of the Sophists was to prepare their pupils for success in public affairs, particularly by exercises on the more usual commonplaces of practical life, and by sharpening the oratorical and dialectic skill of the young men; some of them also taught mathematics and astronomy, as well as philosophy and morals. There has been hot controversy over the character and conduct of the Sophists Grote's view may be accepted as most in accordance with the evidence. The odious part of the connotation of the term 'Sophist' was stamped upon it by Plato, who, like Socrates, had a vehement repugnance against receiving pay for teaching. There is really no proof that any of the reputable Sophists were 'peculiarly greedy, exorbitant, and truckling,' or that, as Plato has been misinterpreted to convey, they 'poisoned and demoralised, by corrupt teaching, the Athenian moral character.' The difference of attitude of Plato and the Sophists must be carefully observed: Plato was a great and systematic *theorist*; the Sophists were men of wide knowledge, great intellectual force, and imposing personality, who directed their professional energies to the practical end of qualifying young men 'to think, speak, and act,' with effect.—There were no *girls' schools* at Athens. The education and culture of the female sex was not provided for by law; it was left to custom and to the personal notions of the household and the family. Girls picked up whatever instruction they received from their mothers and from the women-servants. The subjects were, for the most part, of purely feminine concern—spinning, weaving, sewing, and the like; in the better households also reading and writing. The duties of religion, with the popular beliefs respecting the gods, and the general rules of proper and becoming behaviour would be inculcated as opportunity offered. About fifteen the Athenian girl usually got married, and might obtain further instruction, in an incidental way, from her husband, or she might not. He would take her to see tragedy at the theatre; he would, almost certainly, not permit her to see a comedy acted.

Athletics.—This term is one of a group of allied terms which have come into the vocabulary of modern physical education ready-made, so to speak, from that of the physical culture of the ancient Greeks. Gymnastics and calisthenics are others.

And while the last-named still retains its old limitation to those lighter forms of gymnastics tending to develop symmetry of limb and grace of movement (*see* CALISTHENICS, *infra*), the two other terms—athletics and gymnastics—have lost such technical differences of meaning as they had in connection with the elaborate training of the young Greek athlete for the national contests at Olympia, and have acquired modern meanings with shades of difference purely arbitrary and by no means permanently distinctive.

It will therefore facilitate the exposition of this subject, now become of the first importance educationally, if the two are treated of under one heading. And, further, it will be desirable to include the other forms of bodily exercise, such as play and games, where, though the amount of organisation or system is slight, yet a very definite educative value exists from the point of view of physical development. In this way, under the term athletics there will be comprehended, (*a*) unorganised athletics or play; (*b*) partially organised athletics, which would include all outdoor games and sports, and which may be called *social* athletics; and (*c*) fully organised athletics, which, in their lighter form, aim principally at the individual bodily development of girls and women, and are designated calisthenics, and in their more masculine form are called gymnastics.

Athletics have not assumed this fully organised form in England till in quite recent years. The explanation of this phenomenon is not far to seek, when we remember that the dislike of elaborate system and drill, and the admiration for spontaneity and individualism, are peculiarly English characteristics. In fact, the very prevalence of athletics in the unorganised form of games, and the almost scientific elaboration of their rules, has naturally acted against the introduction of the more artificial and less spontaneous forms of organised gymnastics.

But a slight sketch of the development of the athletic idea in this country will not be out of place here, and will serve to explain how materially we differ in our attitude towards schemes of physical training for the young from almost every other nation which has adopted them. In the great military age of English life, which, for our purposes, may be said to have closed with the reign of Henry VIII., the manly exercises by which the English gentleman was trained were riding, hunting, and shooting; these, with the home exercises of wrestling, tilting, and tourneying, insured skill in the fight and endurance in the field. The necessities of domestic or national defence at first, and, afterwards, of that great aggressive movement which for more than one hundred years had the fair provinces of France as its goal and object, made the English yeoman and villain also, who followed his liege lord to battle, or who took service as a professional soldier, an accomplished athlete by making him a sturdy campaigner and an accurate marksman with the long bow.

The enactment of Henry VIII., which required that 'every man not lame, decrepit, or maimed do use and exercise shooting in long bows and also do have a bow and arrows ready in his house, and do learn the men children in his house and bring them up in shooting,' tended to bring athletic physical training down to the lower ranks of English society. But the decay of feudalism, and the change of the military system to one resting less on the individual marksman's skill, and more on the sheer weight of the fighting masses pressing forward pike in hand, produced a change in the sentiment of what pursuits became an Englishman, which was further intensified, in the wealthier classes, by the introduction of the new learning. So it came to pass that the English gentleman devoted less and less time to 'sports' and more and more to 'letters.' Cardinal Pole exhibited the presence of this unathletic spirit of the new era—exaggerated, perhaps, because drawn from a monastic or ecclesiastical standpoint—when he said (1556), 'First and most principal of all ill customs is that which toucheth the education of the nobility, whom we see customably brought up in hunting and hawking, &c.' The large schools for the education of the young nobility, which were all founded or placed on a permanent footing about this time—Winchester, Eton, Harrow, Westminster, and Rugby—endeavoured to set the minds of young England in this new anti-athletic direction. These schools were presided over by ecclesiastics who, as regards their

attitude towards bodily, as opposed to mental, training, reflected the spirit of Pole, and set up ideals of education which totally disregarded the body, and sought the vigorous repression of the animalism of youth, instead of its rational regulation.

But the youth took the matter into their own hands. Inheriting the traditions of a bygone time, and the aptitudes of athletic ancestors, they developed organised play in their own ways, which were sometimes tolerated by their masters, and often kept in narrow bounds by rigid school statute, such as that for Shrewsbury School in 1578, which laid down that boys should play 'only on Thursdays.'

Thus athletics in the public schools have remained in the hands of the boys, more or less, down to our own day. School games have been tolerated and encouraged as a useful vent for the animal spirits, a tamer of boyish wildnesses less irksome to the schoolmaster and more self-acting than repressive discipline, a queller of surging passions by working the full-blooded and high-mettled 'up to the point of fatigue.'

This policy on the part of the authorities has given a status to school games in the great public schools which is out of all proportion to their value, and which is maintained at the expense of the intellectual studies. The good servant has become a bad master; and the outcry has gained force and volume, as to more than one of our great public schools, that athletics are more eagerly pursued than the classics, and that 'place and power' at school and college are assigned more for proficiency and power at cricket, rowing, or football, than for distinction in the time-honoured intellectual pursuits of the place.

But within the last two or three decades the scientific spirit of the age, surveying the whole field of education with a fuller knowledge of the physiology of the human frame, has brought into prominence the absolute dependence of the healthy mind upon the healthy body. Physical training has, therefore, become, equally with mental training, the concern of the teacher who seeks to carry out the modern educational ideal. The lead in this matter was given by the Germans. So early as the latter part of the last century Basedow (*q.v.*), instigated thereto by Rousseau's *Émile*, established his celebrated school, the Philanthropinon, at Dessau (1771), where the educational curriculum included (1) lessons on the structure and functions of the human body, (2) manual instruction by means of carpentry and wood-carving, and (3) regular exercises in walking, running, riding, dancing, and wrestling. But the remarkable progress of gymnastics in Germany, as a part of school education, is due to the energy and organising ability of Jahn (*q.v.*) and his disciples. Under the stimulus of his reforming spirit and the grand ideal he set before his countrymen of a united nation, intellectually, morally, and physically strong, gymnastics, under the name of *Turnen*, became (1842) a recognised part of national education from the primary schools to the universities. In Switzerland, Fellenberg (*q.v.*) and his successors, taking up and carrying on the educational ideals of Pestalozzi (*q.v.*), succeeded in founding and maintaining at Hofwyl, near Berne, a group of schools organised 'for the harmonious development of every human faculty.' Regular gymnastic exercises were insisted upon for each pupil; every encouragement was given to voluntary exercise in the form of games, bathing, carpentry, and gardening, and music was considered to be a branch of physical education, having powerful moral influences; while the succession of hours of study, exercise, musical instruction, play, and sleep were carefully regulated and adapted to the age and strength of the pupil. Lastly, systematic training in gymnastics was popularised in Sweden by Ling (*q.v.*). Ling's system of bodily training has found considerable favour in England also, especially in girls' schools, on the ground that it is less severe than the German system, and pays more regard to physical training in its medical aspect. Less apparatus, too, is required under this system than under any other.

Compared with the dates of the introduction of organic gymnastics into the above-named countries, the recognition of them as part of the school course in England is quite recent, and is still extremely partial in character. Gymnasia are to be found at both the universities of Oxford and Cambridge, fully equipped with the most approved apparatus and appliances. Most of the large public schools also

possess gymnasia. But neither at the universities nor public schools are courses of physical instruction scientifically laid out to suit the physical condition of the individual student, though such is the case at Harvard and other universities in the United States.

Two of the larger grammar schools, however, King Edward's School, Birmingham, and the High School, Manchester, have not only been supplied with gymnasia, but systematic training, under a physical instructor on the staff of these schools, is given to every pupil—and in the former instance to girls as well as boys—as part of the regular school course. Some of the larger School Boards, too, notably those of Birmingham and Manchester, have taken the lead in recognising the importance of physical training for the children of the working classes, by providing spacious playgrounds and simple apparatus, appointing a superintendent of physical instruction, and setting apart a portion of each day's school-time for physical exercises. The School Boards for London, Nottingham, and other towns, are following the lead thus given, and there is every sign that the movement will spread rapidly in the large centres of population under the stimulus of a more enlightened public opinion.

The essentials of a sound athletic training for the young have nowhere been more clearly enunciated than by Mr. John Holm at the 'Conference on Education under Healthy Conditions,' held in Manchester in 1885 :—

(*a*) All gymnastic exercises should be devised with a due regard to the structure and functions of the body, and should be formed on an accurate knowledge of anatomy and physiology. (*b*) Every exercise should have a definite aim, and be localised, so that its action is understood. (*c*) Every part of the body should be exercised in turn, and, having due regard to the physiological function, not any one part in excess of another. (*d*) Harmony of function, including suppleness, should be regarded as of equal importance with the development of muscular power. (*e*) All exercises, while directed to the development of strength, should be kept well within the vital capacity of the individual, so that his powers are strengthened instead of being exhausted.

A word may not be inappropriate here on the developments which have taken place in the scientific basis of the athletic sports of the English people. Cricket in England and, latterly, baseball in America, looked upon as developments of bat and ball games, have reached a point of scientific elaboration which makes success in the 'art' a matter of years of practice following upon natural aptitude. The greatest development of recent years has been witnessed in the direction of football, which may now fairly rank as high, if not higher, in popularity as its older compeer, cricket, and which, from its comparative inexpensiveness, bids fair to become, if it has not already become, the national athletic game. The scientific forms of this game have assumed, with other minor varieties (such as the Eton game, and the 'Wall-game'), two permanent shapes under the names of 'Association Football' and 'Rugby Football.' These are in reality two distinct games. The former derives its authority and scientific form from the decrees of the Football Association, which was started in 1863, and the latter from the Rugby Union, which was formed at about the same time to adopt the game so long identified with the school close at Rugby to the wider arena of the great towns and to adult players.

These games are so essentially different that, practically, most football clubs are formed to play one or other of them, and very few clubs send teams into the field for both games. The 'Association' game is the more popular for adults, the 'Rugby' game holds its own principally among school boys and those who have played the public schools. This latter game is considered more dangerous for full-grown adults than for the growing boy.

Among the adverse criticisms which have been passed upon athletics, it may be useful to mention one or two. They have been charged with seriously arresting the development of the mind : the evidence in this direction bears only upon an excessive addiction to athleticism. As regards football, the intensity of rivalry between school and school, and between club and club, is made responsible for a subordination of the interest of the game itself to the desire for victory—*si possis recte, si non, quocumque modo* ; with

the result that unseemly quarrels, unfairness in play, even intentional ill-usage of an adversary, and at most a too professional spirit, have partially destroyed the good moral effects which follow from the effort to win by co-operation, and loyalty, and self-control. There is doubtless, too, frequently a basis of truth in these charges. It is said that betting is an accompaniment of the modern athletic sports, and in so far that that is the case, a vigorous repression of this evil should be set on foot by all well-wishers to the youth of England. Again, those who charge athletics with an undue expenditure of nervous energy, which is so much loss to intellectual work, also object on the ground of its encroachment upon the body's requirements in the way of rest. But, in answer to this, it may be pointed out that the need of rest other than that of sleep in the case of youths is very doubtful. Herbert Spencer, in the thoughtful chapter on Physical Education in his *Education*, justly claims for that sportive activity which is characteristic of the young of all animals, if indulged in in obedience to bodily sensations, a real rest and recreation. It remains, however, to be said that the same writer has furnished one of the severest criticisms against athletics, on the ground of its artificiality. Gymnastics he calls 'a system of factitious exercises,' which, though better than nothing, are to him an inadequate substitute for the naturalness of play; inferior both in quantity of muscular exertion and in quality; and, moreover, wanting in that element of spontaneous happiness which is the most powerful of tonics. That our greatest living educational philosopher should take a strong view of the intrinsic superiority of play to gymnastics, on many grounds, is a call to the believers in the new athleticism to give a reason for the faith that is in them; and, at the same time, by putting them on the defensive, ensures that developments of this side of the education of the youth of the country shall not transgress the limits which can be justified by experience, and which cannot be exceeded without imprudence.

The best treatises on gymnastics in the English language are those written by the late Mr. McLaren of Oxford. His *Military System of Gymnastic Exercises for the use of Instructors*, *Training in Theory and Practice*, and *Physical Education*, together form a complete library of physical training and hygiene. His system is considered to be much more thorough and practical than the German, and is based upon the sound principle that the first requisite for the development of physical power is a simple and gradually progressive course of exercises, adapted to the definite physical conditions of the person to be trained.

Atlases. *See* MAPS.

Attendance.—Without regularity of attendance satisfactory progress is impossible. The thorough mastery of one lesson generally depends upon the preceding lesson having been learned; consequently the child who misses the first is likely to be incapable of benefiting by the second. Nor is the evil confined to the individual, for the whole class has to wait while the teacher is helping the pupils who have been absent to overtake the rest. The mischief does not end even with loss of lessons or waste of time. Education is concerned with the formation of good habits as well as with the acquisition of knowledge, and it is impossible for a child who is often kept away from school to form a habit of regularity—a habit not only valuable in itself, but the foundation of many others that are valuable also.

Good attendance may be promoted: (1) By making school pleasant physically. The rooms should be clean, light, well ventilated, and (in winter) well warmed. The walls should be bright with pictures and the windows with flowers. (2) By making school pleasant morally. The whole tone should be kindly and cheerful. The teachers should never shout, or speak harshly; the discipline, though necessarily firm, should be mild; and work, though necessarily hard, should be agreeable. (3) By cultivating friendly relations with the parents and interesting them in the progress of their children. 'Speech days,' breaking-up parties, prize distributions, and 'public examinations' have been found very useful in this respect. (4) By sending notes to, or requiring notes from, the parents in all cases of absence. This is a very effective method of preventing truancy, for it renders immediate detection certain. (5) By giving rewards for good

attendance. (*See* REWARDS AND PUNISHMENTS). (6) By a steady, consistent, and discreet use of the power of compulsion. (*See* SCHOOL BOARDS.)

Attention.—The full development of the power of voluntary attention is seen in what is known as *concentration*—i.e. the resolute keeping of the mind fixed on one subject and what is relevant to this, and the turning away from all distracting objects and suggestions. All prolonged attention implies the presence of a feeling, which feeling is the source of what we call *interest* (*q.v.*) In educating the attention the teacher must aim at enlarging the sources of interest, and at gradually strengthening the power of voluntarily concentrating the thoughts. The obstacles to attention differ according to the nature of the child. Some are indisposed to attend from mental dulness and indolence. It is obvious, too, that any falling off in vigour of brain through ill-health or fatigue must induce a lethargic condition which is unfavourable to the exercise of attention. Many children, moreover, who are by no means dull and inactive, prove bad subjects for that sustained attention required by the school-teacher. Thus there is the familiar butterfly type of mind that flits unwearyingly from subject to subject, yet finds any prolonged effort of attention irksome. Then, too, there is the dreamy imaginative mind which tends to be absorbed in its own inner world, and to grow dull and seemingly stupid in relation to external impressions (*see* ABSENT-MINDEDNESS). In building up the habit of attention, care must be taken at the outset to remove as far as possible all sources of distraction and mental preoccupation, and not to exact too long and fatiguing an effort at one time. Variety of occupation and a certain measure of relaxation should thus be introduced into school life. Any form of occupation which has become thoroughly familiar and easy by repetition may serve as a relief to the attention. (*See* Sully's *Handbook*, chap. vi., and the references there added.)

Australia (Education in). *See* LAW (EDUCATIONAL).

Australian Universities. *See* UNIVERSITIES.

Austrian Universities. *See* UNIVERSITIES.

Authority. *See* DISCIPLINE.

B

Babylonia, Schools of. *See* SCHOOLS OF ANTIQUITY.

Bacon, Francis. *See* COMENIUS.

Baird Lectures. *See* PRELECTIONS.

Bampton Lectures. *See* PRELECTIONS.

Barlow Lectures. *See* PRELECTIONS.

Basedow, Johann Bernhard. *See* REFORMATION.

Bashfulness, or shyness, is a well-marked characteristic of childhood. Its proper exciting cause is the presence of a stranger. This appears to evoke a distinct form of inherited fear. Bashfulness shows itself later, and presupposes a certain development of self-consciousness. It may be defined as a feeling of timidity arising from distrust in one's own powers when under the observation of another. The feeling is thus nourished by the general timidity of childhood, and in a special way by the child's sensibility to others' opinion and the desire to please. In its intenser degrees it constitutes an acute form of suffering, and in the case of more than one distinguished child has been a source of real misery in early years. It tends to produce awkwardness of manner, inability to converse with others, &c. In the case of children who are specially eager to please, though the victims of self-distrust, it often engenders an unnatural and affected manner. In extreme instances it may even lead to a morbid shrinking from society. It is a quality which calls for the special consideration of the educator. A certain measure of shyness is proper to childhood, and the anxiety of which it is an expression has its moral value, since it favours a nice care in behaviour. At the same time it must clearly be kept within due bounds. The educator should remember in dealing with bashful children that the feeling is deepened and fixed by every form of repression and discouragement. Its proper corrective is the gradual accustoming of the child to the society and conversation of others, and the encouragement of it in the natural exercise of its powers under

these circumstances. School education, with its greater publicity, commonly acts as a corrective to the shyness due to the exclusion of the home. Yet, just because of this publicity, and the severe demand which it makes on the child's self-confidence, the school-teacher has a specially difficult task in the treatment of shyness. (On the nature of the feeling, *see* Bain, *Mental and Moral Science*, bk. iii. chap. iv. § iv. On its educational aspects, *see* Locke, *Education*, § 70 ; article 'Blödigkeit,' in Schmidt's *Encyclopädie*.)

Bathing.—The addition of a swimming-bath to every large school would be a most potent factor in leading to increased healthiness of school children. Failing this, the managers of each school should get admission for the scholars to public baths in the neighbourhood, or in country schools a neighbouring stream or pond (not too deep) should be chosen for the purpose. It should always be remembered that running water has a more benumbing effect than stagnant water, owing to the fact that in the former case different layers of water are constantly coming in contact with the body, rapidly abstracting heat, and increasing the danger of cramp or fainting. Wherever the bath, scholars should only be allowed to frequent it under strict supervision, and the following rules should be carefully followed: 1. The bath should not be taken within two hours of the last meal. 2. Children should not be allowed to loiter in undressing. A sharp walk before entering the bath is advisible, in order that the skin may be warm and glowing at the time the bath is taken. 3. Children should not be allowed to remain in the bath too long, nor in any case until chattering of teeth or blueness of the lips or nails is produced. The person in charge of the swimming-bath should understand how to use the proper restoratives in case of accidental immersion, and these measures should be vigorously and steadily employed. (*See* SCHOOL SURGERY.) No boy should be allowed to row until he has learnt to swim. The temperature of the water in the swimming-bath should be from 65° to 70° Fahr., when it is intended that children should remain in it beyond a few minutes. Where this temperature is artificially kept up, the hot water must be introduced at the lowest level of the bath, for, being specifically lighter than cold water, it tends to rise to the surface. In addition to its effect on cleanliness, and in improving the general tone of the system, bathing combines, in the form of swimming, both exercise and bathing. Swimming tends to expand the chest and enlarge the lungs, at the same time strengthening the muscles of the trunk and limbs.

Bede. *See* MIDDLE AGES.

Belgian Universities. *See* UNIVERSITIES.

Bell, Andrew, the inventor of the 'Madras system' of monitorial instruction, was born at St. Andrews on March 27, 1753. Having completed with credit the course of education given at the university of his native city, he determined to seek his fortune where Scotchmen of good education were rarer than in Scotland. In 1774 accordingly he set sail for America, where he found employment as tutor. In 1781, the colony being in the throes of the War of Independence, Bell returned to Scotland. He acted for a time as 'coach' at the university, but seeing little prospect of advancement he wrote to America to know if there was 'any encouragement in the line of the Church.' In 1784 he took orders, but finding little 'encouragement,' resolved to try his fortune in India. He reached Madras in 1787, and there brought his merits before the authorities with such pertinacity that in less than three years he was holding seven appointments in the army as chaplain or deputy chaplain; he was likewise undertaker at Fort St. George, and superintendent of the Military Male Orphan Asylum. The latter was opened in 1789. It was housed at Egmore, in an abandoned redoubt, which at first provided a home for about a hundred children, but this number was gradually raised to two hundred. When Bell became superintendent he found one master and two ushers employed in instructing less than a score of boys. The teachers were men who had never been trained to tuition, and he found it difficult to bring them into his own views. Discipline was weak and progress slow. Bell proposed various alterations to strengthen the one and quicken the other; but the master and ushers considered each alteration as a reflection on their capacity or diligence, and resented interference. Things were in this state when Bell, as narrated in the article on the monitorial system (*q.v.*),

saw the children in a Malabar school writing in sand, and thus hit upon the germ of his system. In 1796 he returned to England, and in the following year published a forty-eight page pamphlet entitled, *An Experiment in Education suggesting a System by which a School or Family may Teach itself under the Superintendence of the Master or Parent.* It attracted no attention, and the Madras system, though adopted in 1798 at St. Botolph's, Aldgate, and in 1799 at Kendal, remained practically unknown till 1805.

Meanwhile Joseph Lancaster (*q.v.*) had been conducting a large school on the monitorial plan. He maintained that for the method which he followed he was in no way indebted to Dr. Bell, having hit upon it before he saw a copy of the *Experiment.* He admitted, however, that he got several useful hints from the pamphlet, and on the '21st of the 11th month, 1804,' he wrote to the author for information on some points of detail. Bell answered in the most friendly spirit, inviting Lancaster to Swanage, where he had a living, and asking his help in preparing a second edition of the *Experiment.* Thus far Bell regarded Lancaster as 'doing his work for him,' but a bitter war broke out, involving all the leading magazines and newspapers.

Bell brought his system under the notice of persons interested in maintaining the supremacy of the Church, and soon obtained considerable support. In 1806 the plan was introduced into a day-school at Swanage and into one at Whitechapel. Next year Bell spent some months in London organising two schools —one a school which, for example's sake, the Archbishop of Canterbury had established in Lambeth, and the other the Royal Military School, Chelsea. Early in 1808 a school which had been built and endowed by an enthusiastic admirer was opened in Gower's Walk, Whitechapel. In the same year the system was introduced into a new school in Marylebone, and Bell paid a visit to Durham for the purpose of organising the schools of the country. This visit brought him under the notice of the Bishop, who appointed him master of Sherburn Hospital.

The year 1808 was an epoch in the history of Bell's rival, for then was established the Royal Lancasterian Institution for the Education of the Poor, converted in 1813 into the British and Foreign School Society (*q.v.*). The success of the unsectarian association seriously alarmed the dignitaries of the Church, who, in 1811, established the National Society (*q.v.*) The principal work of Dr. Bell's life was now accomplished, and his remaining years may be passed over rapidly. In 1812 his old university gave him the degree of D.D. In 1814 he visited Ireland, in 1816 he made a tour on the Continent, and in 1818 he was appointed prebendary of Hereford Cathedral, whence he was transferred to Westminster. Bell accumulated enormous wealth, which became a sorrow to him. Finally he bequeathed most of it for the promotion of his system.

Beneke, Friedrich Edward (*b.* 1798, *d.* 1854).—A German philosopher who rendered considerable service in establishing the true principles of the art of teaching. He was professor of philosophy at Göttingen and Berlin from 1822. He was the author of a large number of philosophical treatises, and, in opposition to the popular idealist or *a priori* school of his day, whose chief representative was Hegel (*q.v.*), Beneke adhered to a form of the Experience Philosophy very similar to that of Locke, Hume, J. S. Mill, and the principal English philosophers of the same empirical school. That part of his system to which Beneke attached most importance was his psychology, which bears a considerable resemblance to the doctrines of Herbart (*q.v.*), and the results of which he applied to education. The chief works in which he developed his ideas in this department are: (1) his *Doctrine of Education and Instruction* (*Erziehungs- und Unterrichtslehre*, 3rd edit. by Dressler, 1864); (2) his *Logic as the Doctrine of the Art of Thinking* (*Logik als Kunstlehre des Denkens*, 1842); and (3) his *Pragmatic Philosophy, or Psychology in its Application to Life* (*Pragmatische Philosophie oder Seelenlehre in der Anwendung auf das Leben*, 1850). The development of intellectual consciousness, according to Beneke, depends entirely on the fact that the human mind is endowed with the capacity of receiving impressions from external material phenomena. His theory, which had been anticipated by the English philosophers like Locke and James Mill, is capable of very fruitful application in education, and attracted great attention amongst German pedagogues. (*See*

Schmidt's 'Biography of Beneke' in *Diesterweg's Pädagogisches Jahrbuch*, 1856, and Dressler's monograph on *Beneke and his Writings*, or in the 3rd edit. of the *Lehrbuch der Pyschologie*, 1861.)

Bentham, Jeremy (1748–1832), attempted to carry into the domain of education those principles of utility which he applied in other departments of thought and action. His views were set forth in a book published in 1816 under the title '*Chrestomathia*: being a collection of papers explanatory of the design of an institution proposed to be set on foot under the name of the Chrestomathic Day Schools or Chrestomathic School for the extension of the new monitorial system of instruction to the higher branches of learning for the use of the middling and higher ranks of life.'

Bentham maintained that the 'education proper for civil and active life' had been neglected, and that nothing had been done to enable those who were 'to conduct the affairs of the world, to carry them on in a manner worthy of the age and country' in which they lived, by 'communicating to them the knowledge and the spirit of their age and country.' The reformed curriculum proposed to include (for boys and girls of seven to fourteen) reading, writing, arithmetic, English, Greek, Latin, French, German, drawing, geometry, book-keeping, nearly every known science and a few unknown ones, such as hygiastics, prophylactics, zohygiastics and phthisozoics. Greek and Latin were deposed from their place of pride, and the prominence hitherto assigned to them was given to physical studies. It will thus be seen that Bentham held the views advocated in our day with great force and clearness by Herbert Spencer. On the chrestomathic scheme education 'is to consist in the administration of infinitesimal doses of knowledge, a little drop of this, a pinch of that, an atom of the third article, and so on—the names and technicalities of a great range of subjects and mastery and power over none. . . . It condemns itself as a method of teaching superficiality and socialism on system.' (Joseph Payne.)

Only one attempt was made to put Bentham's views into practice. In February 1814 an association was formed to establish a chrestomathic school in Westminster. Brougham, Romilly, Mackintosh, James Mill, Wakefield, Francis Place (the Radical tailor of Charing Cross), William Allen (the first treasurer), Joseph Fox (the first secretary of the British and Foreign School Society), and others assisted in the formation of the society. Bentham offered part of his garden at the back of the Recruit House in Birdcage Walk as a site for the school; rooms were built—on paper; meetings were held and plans were discussed, but all came to naught. The scheme was abandoned in 1820; Bentham's book is its monument.

Bible (Gr. *τὰ βιβλία*).—The books or scriptures containing the Old and New Testaments. Whether regarded as the inspired Word of God, and consequently the ultimate standard of morals, or merely as a time-honoured collection of historical, poetical, and ethical literature, a knowledge of the Bible is indispensable to education, especially to the education of Englishmen, upon whose history it has exerted so powerful an influence, England having been at the most eventful period in its annals 'the land of one book,' namely, the Bible. Much controversy, however, has arisen upon the question whether it is the function of the schoolmaster to impart this knowledge. By the majority of the religious sects, who hold that the Bible contains the sole rule of faith and practice, it is contended that not merely a literary knowledge of it, but a doctrinal knowledge of it is essential to the development of the moral character, and accordingly, in most of the sectarian schools in this country, instruction in the Bible is prescribed as a provision of the first importance. Other religious sects, however, holding equally a belief in the Divine origin of the Scriptures, and equally desirous that children should be instructed in them, contend that the instruction should be given, not by the schoolmaster, but by ministers and parents. Bible teaching in schools under the School Boards is left to the decision of those bodies, and as a rule a compromise is arrived at by the adoption of the regulation that the Bible shall be read without comment.

Bifurcation. *See* CLASSIFICATION.

Biology.—This subject, although, as its name implies, the science of life, is not to be confounded with the sciences which treat of the two great classes of living beings, namely, Botany and Zoology. The complete and exhaustive study of

plants and animals in their endless variety of form, structure, relation, habits, and distribution, contemplated by these two branches of Natural Science, gives place in biology to the study of the phenomena of life in a generalised way. It is therefore placed by modern scientists among the fundamental or pure sciences, among which mathematics stands first as the most abstract as well as the most general, then in order, physics, chemistry, biology, psychology, sociology. In placing it fourth on the list, an indication is given of the sciences that are presupposed and must precede it if it is to be successfully studied. We provide for this by including a certain amount of mathematics in the school course, together with the beginnings of physics and chemistry, on our 'modern sides' at any rate, leaving biology for the college lecture-room and laboratory after specialisation has commenced.

This does not preclude the introduction of botany and zoology (*q.v.*) into schools, for though the objects dealt with may be the same as in biology, they are treated in these sciences from an altogether different standpoint, the order in which facts about these objects are presented to children being necessarily different from that suitable for the university student.

In pursuing the subject of biology, leading types are selected for exhaustive study, in order that the conditions and phenomena of life at all its stages may be fully grasped. The lowest forms of both plants and animals are studied first, as presenting the simplest structure, and the gradual differentiation of the primitive life-material is followed out. The physiological processes taking place in the most complex forms are thus seen to resemble in principle those which go on in the most simple.

Each student must work practically dissecting instruments and microscope, and record his observations both in words and by means of drawings of what is seen. The function of the teacher consists in directing and guiding the work ; and this is done at the universities both by lectures and by individual help in the laboratory. Several useful text-books have been published, such as Huxley and Martin's *Practical Biology*, but the reading of these would be useless without the practical work indicated.

Birkbeck, George, M.D. (*b.* at Settle 1776, *d.* 1841).—At the Andersonian Institution, Glasgow, in 1799, he commenced his lectures on natural and experimental philosophy. For these lectures he had no good instruments, and had to employ ordinary workmen. Whilst watching the men construct a centrifugal pump, of the use of which they were ignorant, it first occurred to him to give them a course of scientific instruction. In March 1800 he communicated his wishes to the trustees of the Andersonian Institution. They regarded him as a dreamer, and nothing came of his proposal that session ; but later he lectured to the mechanics of Glasgow with the greatest success. He removed to London, and in 1820 lectured there. In the *Mechanics' Magazine*, October 11, 1823, appeared his 'Proposals for a London Mechanics' Institute.' After various preliminary meetings, on December 15, 1823, the officers of the 'London Mechanics' Institution' were appointed, and Dr. Birkbeck was elected president, which office he held till his death. The movement for promoting adult education (*q.v.*) which he thus inaugurated rapidly spread, and mechanics' institutes were founded in almost every centre of industry throughout the country. The Birkbeck Institution in Chancery Lane, London, which, without the assistance of wealthy endowments, carries on the work of a great university and technical school combined, is a noble monument to Dr. Birkbeck's memory.

Blackboard. *See* FURNITURE, and ARCHITECTURE OF SCHOOLS, sect. *Classrooms.*

Blind (Education of). *See* EDUCATION OF THE BLIND.

Board School. *See* SCHOOL BOARDS.

Borsippa. *See* SCHOOLS OF ANTIQUITY, sect. *Assyria.*

Botany.—The suitability of this subject to form a branch of school instruction is now recognised by all who plead the cause of science as a necessary factor in a well-balanced education. Many reasons may be adduced to show that the sciences of observation and classification should precede the experimental and mathematical. There are many advantages in beginning with zoology (*q.v.*) ; but though animals may be more interesting than plants to quite young children, there is no lack of interest in the colours, forms, modes of growth and development of the

plant when attention is directed to them by a good teacher. And it may be urged in favour of botany that specimens of plants are more readily procured ; their greater simplicity of structure, as compared with animals, enables the pupils to examine more thoroughly, and to study the minuter and obscurer parts more completely. Botany will, therefore, be found of greater value educationally for classes above the lowest. The first lessons should take the form of object-lessons. The pupils must each be furnished with specimens, and the teacher's work will consist in directing observation to the number, shape, position, and other characteristics of their parts. By suitable questions he will guide the children to express these facts in their own words, and by degrees supply them with suitable technical terms. But the good teacher will not be in haste to supply such terms, knowing that children only too readily retain words and reproduce them without attaching definite ideas to them. For hints on this point Mrs. Kitchener's little work, *A Year's Botany*, will be found very helpful.

In order to register the facts, and even to ensure that all see what they profess to see, it is a good plan to require the pupils, from the very first, to draw in outline the points observed. The object of the drawing is to bring into prominence leading features. Thus, if leaves are being studied, a picture of a leaf need not be attempted, but simple outlines drawn in order to contrast shapes, small portions of the margins in order to contrast their indentations, etc., etc. In the case of the flower, single parts, such as a petal or a stamen, will present little difficulty, when it might be found too difficult to represent the flower as a whole. The position of the floral whorls must be indicated in a diagrammatic way ; but these must not be presented to the pupil, as in books on botany, in their complete form ; he must be led to construct them by degrees from the facts observed on the individual specimens.

It is needless to say that the blackboard will be indispensable to the teacher; the outline or diagram growing before the eyes of the class will be far more effective than finished drawings. A work like Professor Henslow's *Floral Dissections* will help to show what should be drawn.

Another valuable aid in teaching is the schedule or ruled form, in which the pupil registers his observations in words. This need not be invariable in arrangement, but adapted to the stage of the learner, as shown by Miss Youmans in her *First Book of Botany*, and it can be filled up without using technical terms.

The study of plant life must not, however, be confined to dead and dismembered specimens. A few pots covered with hand-glasses in the school-room windows will enable the pupils to watch from day to day the gradual unfolding of the perfect plant from the seed ; and they should be encouraged to make careful notes of their observations. But opportunities must also be made for observing growing plants in their self-chosen habitat in field and hedge and wood. The modes of folding of leaf-buds, the time of opening of flowers, and many other points can be noted only in this manner. Open-air work has also indirect advantages which will be apparent to every thoughtful teacher. It supplies a motive for healthful exercise ; it adds to the interest of country walks ; it carries the work of the school-room into the home-life in a way that no formal lessons can do.

When a habit of careful and systematic observation has been acquired in this way, and a sufficient number of facts about individual plants have been collected, the pupils may be introduced to the idea of classification. This is generally brought forward too early, and children get the notion that if they can only 'label' a flower they have done all that is required. It is not even necessary for a long time to call plants by their botanical names. If we must have something by which to distinguish them, trivial or local names are by far the best, until the learner fully comprehends the grounds on which the plants are placed in the larger and smaller and ever narrower classes. When this part of the subject is begun, the pupils will be ready to vie with each other in making collections, especially during holiday excursions. These may be taken with various objects, sometimes with a view to the collection of rare species, sometimes merely to illustrate completely the flora of a particular district, sometimes to obtain specimens in which a special characteristic is well brought out.

Whole plants should be dried where possible, and where this cannot be done a drawing may be made of the whole, and

special parts dried. Long before this stage the pupils will have been encouraged to look for and to bring to class good specimens of points under observation. Sometimes these may be worth preserving for future lessons: this can often be done more effectually by immersing them in spirits of wine than by drying them. The physiology of plants is a branch of the subject rather difficult to introduce into school work, and though highly interesting is of less value educationally than the stages already discussed, because the pupils will be dependent on the teacher for the facts (with the exception of a very few). Something can no doubt be done with the aid of good diagrams, and if the school possesses a good microscope a few things can be shown; but the bearing of the facts will not be understood until some advance has been made in Chemistry and Physics.

Boys (Education of).—Milton defines the education of boys to be such education as 'fits a man to perform justly, skilfully, and magnanimously all the offices, both private and public, of peace and war.' Education as thus defined was much better suited for the ancients than for us. Indeed, Xenophon relates of the Persians that their youth were to be instructed in the cardinal points of justice and virtue, in such exercises as would assist them in peace and war, and generally in everything that tended to the public good, not omitting a simple diet. At Athens education was compulsory, and children were instructed in reading, writing, and music; whilst at Rome the education was generally under the guidance of the father, although there were some notable exceptions—such as Cornelia, the mother of the Gracchi, who personally instructed her own boys. Usually a teacher (*ludi magister*) was employed to give instruction in the 'three R's' and rhetoric, although again there were some notable exceptions, such as the elder Cato, who also personally instructed his own boys. The question of the education of boys has been much discussed in our day by Mr. Herbert Spencer, Professor Bain, and other able writers, and they, as was to be expected, do not approve of Milton's definition. A boy's education depends, in the main, upon two elements: the direct instruction given and received, and the indirect influences under which a child is placed while receiving it. The lessons a boy actually learns, the knowledge given him by his teachers or schoolfellows, the gradual development of his intellect, are parts of school life which are within the immediate circle of a school's purposes and management. They are reducible to rule and method, and the success or failure of the rules or methods is ascertainable by direct examination within fairly sufficient limits. But the constant influence of a master's justice, ability, and earnestness, or of his feebleness and carelessness, the sense of order and purpose, or of disorder and helplessness, throughout the daily life, the conflict in temper and ability with schoolfellows, the whole tone and moral atmosphere of both school and home, are no less powerful causes in determining for good or for evil the present exertions and the future conduct of the boy. The primary object of a school, of course, is direct teaching and learning; the indirect influences are the necessary concomitants. These influences are important and vary much. They vary much in private schools (*q.v.*) compared with public schools (*q.v.*), in schools for boarders compared with those for day scholars (*q.v.*). These differences have great weight on a parent determining the school for his boy. It is well that there are such differences, for it is not at all desirable, even if it were possible, to have all schools moulded on one type. There should be no training for employments to the neglect of general cultivation. Such training disorganises and breaks up the teaching; it confers a transitory instead of a permanent benefit. A boy, e.g., taught a particular system of book-keeping at school, finds in the counting-house a different system in practice, and has difficulty in acquiring it; had he had a thorough mastery of arithmetic he could have learned any system in a very short time. The school should never be made a substitute for apprenticeship; it should teach what might fairly be considered as likely to be useful to all its scholars whether as mental discipline or as valuable information. The subjects of instruction, apart from the 'three R's,' may be classified under three heads—language, mathematics (including arithmetic), and natural science; but the command is imperative—ensure a good elementary education before beginning any of those subjects. Latin may be, and usually is, the first branch begun. Edu-

cation, as distinct from direct preparation for employment, may be classified as that which is to stop at about 14, that which is to stop at about 16, and that which is to continue till 18 or 19. The difference in the time assigned makes some difference in the very nature of the education itself If a boy cannot remain at school beyond the age of 14, it is useless to begin teaching him such subjects as require a longer time for their proper study ; if he can continue till 18 or 19, it may be expedient to postpone some studies that would otherwise be commenced early. Outdoor sports and physical exercise should not be neglected. *See* PUBLIC SCHOOLS and ATHLETICS.

Braille System. *See* EDUCATION OF THE BLIND.

Brain.—The brain is the organ chiefly exercised in school-work. It is of the highest importance, therefore, that teachers should understand the broad facts relating to its structure and functions. A true science of education can only be founded on the principles of physiology and psychology.

Structure of brain.—The nervous system consists essentially of fibres called nerves, which carry impressions, and cells which receive and appreciate them. The central organs containing nerve-cells are the brain and spinal cord, and from these pass nerves which go to every part of the body and put them in communication with the central organs. The larger part of the brain consists of the two hemispheres, and there is little doubt that these are the organs of the intellectual powers. Each hemisphere is subdivided into a number of convolutions, having a thin layer of grey matter (nerve-cells) covering them. The more complicated and numerous the convolutions, the greater the intellectual force and activity. Man's brain is absolutely heavier than that of any other animal except the elephant and whale. In relation to the body weight, the preponderance of the human brain is even more striking. Examining the detailed structure of the brain, it is found that in man's brain the cerebral convolutions, and not the lower ganglia (which are concerned with organic life), preponderate, unlike the case in lower animals. The average weight of the brain in the adult European is 49 to 50 ounces. In civilised races it is heavier than in the less civilised. The heaviest brain recorded is that of Cuvier, the naturalist, which was 64½ ounces. At birth the weight of the brain averages 13·87 ounces. It rapidly increases in the earlier years, more slowly in later years, acquiring the greatest average weight at the age of 35 in the male, and of 30 in the female. Mere weight of brain is not the sole criterion of intellectual capacity. The *quality* of the cerebral structure must be taken into account. Exercise of the mental faculties tends to increase the number of cerebral convolutions, to multiply the points of communication between different nerve-cells, and thus to render the brain more efficient, though it may remain stationary in weight. At the sixth month of fœtal life the human brain is smooth, and without convolutions, but at birth the chief convolutions are complete, secondary ones being developed during childhood and youth. We may roughly classify the parts of the central nervous system as follows: 1. The cerebrum, consisting of (1) the cerebral convolutions, which are the central organs of intelligence and volition, and (2) the basal ganglia, which are connected with sensation and the automatic phenomena of life. 2. The cerebellum, or little brain, the chief function of which appears to be the coordination of muscular movements and the maintenance of equilibrium. 3. The medulla oblongata, from which arise (among others) the nerves controlling circulation and respiration. 4. The spinal cord, which serves to transmit nervous impulses between the brain and the periphery, and also acts as an independent centre for reflex and automatic acts.

Functions of brain.—Two sets of nerve-fibres connect the central nerve organs with every part of the body. One set bring sensory impulses from the periphery, which are perceived in the brain, and interpreted by it. Another set carry impulses from the brain to the muscles of the body, resulting in the production of movement. Excitation of a sensory nerve (as by tickling the foot) leads by reflex action to muscular movements, the object of which is to withdraw the foot from the irritation. This reflex action may be carried on when the brain is asleep. If the same movement is effected while the subject of the experiment is awake, the movement is a voluntary one. Or one may prevent the natural impulse to withdrawal of the tickled foot by a voluntary *inhibitory* influence.

The chief functions of the brain are: 1. To receive sensory impulses and interpret these. 2. To control the muscular movements of the body. 3. To serve as the organ of mind, i.e. of feeling, thought, and volition. The preceding view of the functions of the brain has important bearings on practical education. It must not be forgotten that education, using the word in the sense of brain-cultivation, is not confined to schools, but begins at the first moment of life, and continues throughout life without interruption except by sleep. During childhood the sensory and muscular parts of the brain are cultivated to an enormous extent, as also the powers of observation; but the reasoning powers remain to a large extent undeveloped. For the first seven years of life the natural order of evolution of the mental functions should be imitated, the muscular and sensory and observing powers being chiefly cultivated. Kindergarten work is very valuable in this connection. Deficient muscular and sensory cultivation is certain to make all subsequent mental efforts hazy and unpractical. Each sense requires special cultivation, and becomes skilled in proportion to the education it receives. The imperfect cultivation of any sense implies a defective condition of the corresponding part of the brain, and it is also true that the imperfect performance of any one mental function reacts injuriously on others. The blindness of the fishes living in the dark caves of Kentucky is an instance of atrophy of a disused organ. The same lesson is taught by the chickens which were put on a carpet immediately they were hatched, and never showed any tendency to scratch until sand was scattered on it. The lesson of disease also is, that if paralysis occurs in the young, the corresponding part of the brain wastes. Hence muscular and sensory exercise is important, not only because of its immediate utility, but because of its effect on the development of the brain and on the more purely mental functions. *See* also OVERPRESSURE and PHYSICAL EDUCATION.

Breaking up is the term usually applied to the party or ceremony which takes place on the day previous to that on which a school closes for the term. Strictly speaking, however, 'breaking up' means the actual departure of the scholars.

British and Foreign School Society (The) was the outcome of the labours of Joseph Lancaster, though he was in no sense its founder. He undertook so many responsibilities that in 1807 he found himself hopelessly in debt. His creditors were clamorous, and the life of every institution in which he was concerned was threatened, when William Corston and Joseph Fox came to his rescue. At Corston's house, No. 30 Ludgate Street, on January 23, 1808, these two resolved to form a society for the purpose of affording education to the children of the poor. They undertook to pay all Lancaster's debts and to take the whole management of his pecuniary affairs into their own hands. At the end of July Corston and Fox were joined by John Jackson, M.P., Joseph Foster, and William Allen. Allen and Fox were the real leaders of the movement in favour of unsectarian religious education. One of the first acts of the enlarged committee was to ask the public for a loan to be applied in relieving Lancaster's 'inconvenience,' 'fixing his (printing) establishment on a permanent footing,' and 'enabling him to diffuse the good effects of his system more widely'; it was to bear interest at five per cent., and to be repaid as the gains of the printing business allowed. 4,000*l.* was raised almost immediately. In nearly every case the interest was given as an annual subscription, and ultimately the loan converted into a gift. Allen, Fox, and their colleagues used every endeavour to establish schools. They sent Lancaster on lecturing expeditions throughout England, Scotland, and Ireland, and their efforts were rewarded during the first three years of the committee's existence by the opening of eighty-seven schools and the subscribing of nearly 17,000*l.* to local funds or to the central institution. In December 1810 the management was greatly enlarged. The Duke of Bedford and Lord Somerville were chosen presidents, Fox secretary, and Allen treasurer, while there was in addition a 'finance committee' of forty-seven members, including Lords Lansdowne, Moira, Carysfort, Brougham, Romilly, and Messrs. Whitbread, Fowell Buxton, Clarkson, James Mill, and Samuel Rogers. The association was called 'The Society for Promoting the Royal British or Lancasterian System for the Education of the Poor.' The first public meeting of the subscribers was held in May 1811. Next year the last trace of the originally private

character of the movement disappeared. Lancaster proposed that, on condition of his making over to the committee his interest in the Borough Road premises and property, he should be exonerated from all his debts in connection therewith, and the proposition was accepted. The committee then determined upon a reconstitution of the association, and at a meeting held in Kensington Palace in August 1813, under the presidency of the Duke of Kent, the lines for the new organisation were agreed upon. The subscribers met on November 10, and adopted the new constitution. The fourth rule laid down the principle to which the society has always adhered: 'All schools which shall be supplied with teachers at the expense of this institution shall be open to the children of parents of all religious denominations. . . . No catechisms or peculiar tenets shall be taught in the schools.' The king was named the patron of the society, the Duke of Bedford president, while the vice-presidents included ten peers and seven Members of Parliament—among them, in addition to several mentioned before, Lords Byron, Darnley, and Fingall, and Messrs. Grattan and Wilberforce. The duties to which the society addressed itself were: 1. To stimulate and direct local effort towards the establishment and maintenance of schools; 2. To train teachers; 3. To establish kindred societies in foreign countries. After 1830 a fourth duty was recognised, that of promoting the efficiency of schools by friendly and skilled inspection. The success obtained at home and abroad was most encouraging. Schools were opened throughout England and Wales, while flourishing societies were established in Scotland and Ireland, in nearly every European capital, and in India, Australia, and America. The building in Belvedere Place, Borough Road, erected by Lancaster in 1804, was soon found to be too small. A site on the other side of the road was therefore leased from the Corporation of London, and the college and schools built thereon were opened in 1817. The year 1833 marks an epoch in the history of elementary education, for it was in that year that the first Government grants (*q.v.*) were paid. The sum voted by Parliament was 20,000*l*. Every application for a share of it had to be recommended by the British and Foreign School Society, or the National Society (*q.v.*), and the money was to be used only in supplementing local effort for the erection of schoolhouses. In the first year the British and Foreign School Society forwarded memorials soliciting aid towards the building of 211 schools, for which the districts interested had already subscribed 29,383*l*. The schools helped had to be open to inspection, and in 1838 the Lords of the Treasury offered the British and Foreign School Society 500*l*. to inspect the schools which, on its recommendation, had obtained assistance. The committee replied that 'no inquiry could prove satisfactory which was not carried on by parties unconnected with the societies whose schools they were to visit and report upon.' In 1839 Government inspectors were appointed, the British and Foreign School Society being allowed a veto upon the choice of those to be entrusted with the work of examining British schools. In 1842 the college in the Borough Road was rebuilt at a cost of 20,000*l*. Towards this sum the Committee of Council contributed 5,000*l*., and it also contributed 750*l*. a year towards the expenses of the training institution. These grants accentuated a difference of opinion which had been slowly growing up among the members of the society. A section, small in point of numbers, but weighty from character and position, thought the British schools which accepted State aid must finally become either sectarian or secular. A meeting of the subscribers was held on June 1, 1847, to discuss the question. The Rev. John Burnet moved a resolution to the effect that the true policy of the society would be to abstain 'from any declaration of sentiment on the subject' of Government grants, and at the same time to decline accepting such grants. Dr. Lushington, M.P., moved an amendment to the effect that it would be best for the interests of the institution to confide to the discretion of the committee the acceptance or rejection of any further State aid. This was carried by a large majority, and the leaders of the minority thereupon severed their connection with the society. The chief of the seceders was the late Mr. Samuel Morley, but when events proved his fears to be groundless he rejoined the society, and was for years one of its most honoured vice-presidents. On the issue of the Revised Code in 1861, the committee, after considering Mr. Lowe's proposals, recognised 'the soundness of the principle

of a test of the state of elementary instruction in a school as *one* basis of the pecuniary aid rendered,' but condemned the making of this the '*only* basis.' The committee also protested against classification by age, and against the changes affecting teachers. The year 1870 saw the principle which the society had always consistently maintained adopted as the foundation of a national system of education. Mr. Forster's measure, by making it compulsory on each locality to provide sufficient school accommodation, relieved the society of one part of its work—the establishment of schools—but enormously increased another part, the provision of trained teachers. Increased efforts were at once put forth to meet the increased demand, and two new colleges were opened as soon as possible. The society has now six training colleges : Borough Road and Bangor for masters ; Stockwell, Swansea, Darlington, and Saffron Walden for mistresses. Bangor is under local management, and Saffron Walden prepares students specially for infants' schools. If any School Board adopts the system of the British and Foreign School Society there is no reason for maintaining a British school in the district, and many British schools have been transferred to School Boards.

Brougham, Henry Peter, Baron Brougham and Vaux (1778–1868).—Of Brougham's life and character, of his triumphs at the bar and in the senate, of his energy, versatility, and (superficial) omniscience, of his imaginative treatment of facts, of his vanity, recklessness, and eccentricity, this is not the place to speak ; here we are only to deal with him as a promoter of popular education.

Brougham's voice was not quite the first to be raised in Parliament in favour of the instruction of the poor, but it was one of the first, and for some years it was the most powerful. In 1807, when Whitbread introduced a Bill for the establishment of parochial schools, Brougham was not a member of the House of Commons, which he only entered in 1810. It was, however, well known that he was deeply interested in education, and his aid was eagerly sought by the promoters of it. Thus, when the committee of the British and Foreign School Society (*q.v.*) was enlarged in 1810, it was felt that he had earned a place upon it.

At the general election of 1812 Brougham failed to obtain a seat in Parliament, and his exclusion lasted for nearly four years. He was returned again in 1816, and on May 21 he moved for a select committee to inquire into the state of education among the poor of the metropolis. His conciliatory manner disarmed hostility, and the committee was granted without opposition. Brougham was chosen chairman, and under his zealous guidance a vast amount of valuable information was collected. Interpreting its instructions loosely, the committee inquired not only into the means of education for the poor, but also into the management of such schools as the Charterhouse, Westminster, and Christ's Hospital. In 1817 the committee was re-appointed, but Brougham's illness kept it from doing anything. In 1818 it was again appointed, with powers which took in the whole country. Brougham inquired concerning the endowments of Oxford, Cambridge, Eton, and Winchester ; some scandalous revelations were made, and the interests of education were forgotten in a fierce controversy about the policy and conduct of the committee. On June 23, 1819, when Brougham was barely recovered from a serious illness, Peel attacked him fiercely in the House of Commons, and he replied in a speech which he deemed worthy of a place among his published works. It may be added that as a consequence of the labours of the committee a law was passed for the appointment of charity commissioners to correct abuses in the administration of educational trusts. The Bill received the royal sanction on June 10, 1818.

It was very unfortunate that Brougham had allowed his zeal to outrun his discretion, for there had been a general disposition in the House of Commons to do something for the education of the poor, as proved in 1807 by the passing of Whitbread's Bill, and in 1816 by the absence of all opposition to the committee of inquiry. Now the education of the poor came to be regarded by the timid as synonymous with the subversion of the most cherished institutions. In 1820 Brougham tried, when too late, to conciliate the Church, which he had deeply offended. In June he brought in a Bill to provide schools for the whole country. A local rate was to be raised, and the administration of it was to be in the hands of the magistrates

in Quarter Sessions. The schoolmaster was to be a member of the Church of England; he was to be elected on the recommendation of a clergyman, and he was to qualify for office by taking the sacrament within a month of appointment. The attempt at conciliation came too late; the heads of the Church refused to accept from Brougham proposals which they might have welcomed from another—*timeo Danaos et dona ferentes.* On the other hand the Dissenters opposed strenuously a plan which would make the education of the people a monopoly of the establishment and the Bill had to be abandoned.

The next educational work in which we find Brougham engaged was in connection with mechanics' institutes, in the establishment of which he proved a valuable ally to Dr. Birkbeck (*q.v.*).

In 1825 Brougham issued his *Observations on the Education of the People*, which ran through twenty editions before the end of the year. He proposed a scheme for the publication of cheap and instructive books, and the Society for the Diffusion of Useful Knowledge was formed in accordance with his views. The first pamphlet (which was written by Brougham himself) appeared on March 1, 1827.

Another result of the 'Observations' was the establishment in 1828 of the London University—not, indeed, in its present form.

In 1833 Brougham (a peer since 1830) took part in the debates which arose from the proposal of the Government to give building grants (*see* GRANTS), and on May 21, 1835, he moved a series of important resolutions on the subject of education. He proposed that there was a deficiency of school accommodation, that the instruction given in the schools which did exist was insufficient, that infant schools should be fostered, that Parliament ought to give grants in aid, that training colleges for teachers ought to be established, and that a Board of Commissioners ought to be appointed to superintend the education of the country and to apply to it the misappropriated endowments. Nothing practical came of the resolutions.

Brougham out-lived his influence, but not his interest in all that concerned the welfare of the people. So late as 1857 we find him a warm supporter of the Social Science Association. The first formal meeting of the committee was held in his house; he was the first president, and he delivered the inaugural address on October 12, 1857.

Though Brougham made many eloquent speeches, only one phrase of his has become historic, and that had to do with education. Speaking on January 29, 1828, he said:—'Let the soldier be abroad if he will, he can do nothing in this age; there is another personage, a personage less imposing in the eyes of some, perhaps insignificant—*the schoolmaster is abroad*, and I trust him armed with his primer against the soldier in full military array.'

Buchanan, James. *See* YOUNG CHILDREN, EDUCATION OF.

Budæus. *See* REFORMATION.

Bursar.—1. In English, the bursar of a college or monastery is the purse-keeper or treasurer (French *bourse*, a purse; from Low Latin *bursa*, a purse, skin, leather). 2. In Scotland, a person who holds, or is entitled to receive, a bursary (*q.v.*).

Bursary.—1. The treasury of a college or monastery. 2. In the Scottish universities a bursary is a scholarship—a sum of money awarded usually on entrance, and payable annually for a certain number of years, to a student for his maintenance at the university, derived from a permanent investment for the purpose, and sometimes awarded by competitive examination, sometimes bestowed by presentation. At *Aberdeen University* there are, in the Faculty of Arts, (1) about 150 bursaries, of the aggregate annual value of about 2,500*l.*, open to competition on entrance to the Arts course: seven are of 35*l.*, fifteen of 30*l.*, and so on downwards; (2) about eighty presentation bursaries (the bestowal of which is vested in private patrons), of the aggregate annual value of nearly 1,600*l.*: eight are of 40*l.*, two of 33*l.*, three of 30*l.*, and so on down to 5*l.* a year; (3) about thirty bursaries, under the patronage of the magistrates and town council of Aberdeen, of the aggregate annual value of over 400*l.*: these are usually submitted to open competition; (4) four bursaries, of 15*l.* to 30*l.* a year, under the patronage of the incorporated trades of Aberdeen. These Arts bursaries are tenable in nearly every case for four years—that is, for the full curriculum. In the Faculty of Divinity, there are (1) eighteen competition bursaries, of the annual aggregate value of 233*l.*, each tenable for three years; and (2) twenty-three presentation bursa

ries, of the aggregate annual value of over 600*l.*, each tenable for two, three, or four years : four of these are of the yearly value of 75*l.* and tenable for four years, and seven are of 20*l.* In the Faculty of Medicine there are ten bursaries, of the aggregate annual value of about 175*l.* : there is one of 35*l.*, one of 28*l.*, and three of 20*l.* In the Faculty of Law there are three bursaries of 20*l.* a year, and one of 35*l.*, each tenable two years.—At *Edinburgh University* there are in the Faculty of Arts about 180 bursaries (including two of 90*l.* a year, one of 60*l.*, two of 50*l.*, two of 48*l.*, two of 40*l.*, &c.), usually tenable four years, and mostly burdened with special restrictions. In the Faculty of Divinity there are (1) eleven presentation bursaries, varying from 8*l.* to 25*l.*; (2) twenty-two competition bursaries, including two of 52*l.* 10*s.*, one of 40*l.*, one of 35*l.*, &c.; and (3) three of 30*l.*, tenable for four years, gained in the Faculty of Arts, and held at pleasure of the gainers in the Faculty of Divinity. In the Faculty of Medicine, twenty-five bursaries, tenable mostly for four years; including two of 40*l.*, one of 32*l.*, five of 30*l.*, four of 25*l.*, &c. In the Faculty of Law, thirteen bursaries of 19*l.* to 30*l.*; five being of 30*l.*, three of 26*l.* 13*s.* 4*d.*, and four of 25*l.*—At *Glasgow University* there are about seventy bursaries in Arts, including one of 80*l.*, one of 50*l*, several of 40*l.*, &c.; thirty-five in Theology, two of them being of 42*l.*, and six of 41*l.*; fifteen in Medicine, one of them 45*l.*, one 40*l.*, and several 25*l.*; and a considerable number of valuable bursaries common to two or more faculties.—At *St. Andrews University* there are attached to the United College about one hundred bursaries, varying in value from about 5*l.* to 50*l.* a year; nineteen belonging to St. Mary's College, of 6*l.* to 30*l.* a year; and twenty of the same value transferable from the United College when the bursars proceed to the study of Divinity.

Busby, Richard (*b.* Lutton, in the Fens of Lincolnshire, 1606, *d.* 1695).—He obtained a king's scholarship at Westminster, and was subsequently elected to a studentship at Christ Church, Oxford. He was so poor that the parish of St. Margaret's, Westminster, granted him money to pay the fees upon taking his degree in 1628, and he gratefully acknowledged this by making many bequests to the parish. For some time he was tutor at Christ Church. In 1639 he was admitted to the prebend and rectory of Cudworth. He was appointed master of Westminster provisionally when Osbolston was deprived of that office (1638), but the election was not confirmed till 1640. In the Civil War he lost the profits of his rectory and prebend, but in spite of his staunch loyalty and Churchmanship, which led Pym to declare that it would never be right with the nation till they shut up Westminster School, he managed to retain both his studentship and his mastership. One of his troubles during this period was of a local character. The second master, Edward Bagshaw the younger, tried to supplant him, but he was removed out of 'his place for his insolence' in May 1658. Bagshaw published (1659) an account of the transaction from his own point of view. Busby subsequently suffered for his political principles by having his ears cropped in the presence of his pupils. Upon the Restoration Busby's services were recognised, and he was made prebendary of Westminster by the king, and subsequently canon residentiary at Wells. At the coronation of Charles II. Busby carried the ampulla. It was from this time that the story arose which tells us that Busby walked in the presence of the king with his hat on, 'lest the boys should suppose there was any man in the world greater than the master.' He was elected proctor of the chapter of Bath and Wells. Busby became proverbial for severity, and yet his rule seems to have been eminently successful, for he gained the veneration and love of his pupils. A remarkable proof of this may be seen in a letter from Viscount Lanesborough, which is preserved in *Westminster School, Past and Present*, by Forshall (p. 183). The letter begins, 'Dearest Master,' and contains references to the remarkable care of the master. The volume contains other letters also that are scarcely less striking. John Dryden and other distinguished men of his era had been his pupils. The school became famous, and the highest families in the land sought to gain admission for their sons. Steele was of opinion 'that Busby's genius for education had as great an effect upon the age he lived in as that of any ancient philosopher. . . . I have known great numbers of his scholars, and I am confident I could discover a stranger who had been such with a very little conversation; those of great parts

who have passed through his instruction have such a peculiar readiness of fancy and delicacy of taste as is seldom found in men educated elsewhere, though of equal talent.' Atterbury says of Busby, 'he is a man to be reverenced very highly.' Anthony Wood speaks of him as a 'person eminent and exemplary for piety and justice.' Much of his character is shown in *Dr. Basire's Correspondence*. He lies buried in Westminster Abbey.

Buss (Miss) *See* EDUCATION OF GIRLS.

C

Calisthenics (Gr. *καλλισθενής*, adorned with strength — *καλός*, beautiful, and *σθένος*, strength) is the art or practice of taking exercise for health, strength, or grace of movement. It comprehends every kind of action which may tend to give a graceful figure and an easy deportment, from the finest exercises of the drill-instructor to the 'calisthenic exercises of the unfortunate young women' whom Thackeray one day saw pulling the garden roller. It is usually, however, restricted to what is popularly known as drill and kindred exercises, and as such is commonly taught in our schools by some retired corporal. In taking up the first position of drill, in which position the pupil stands before or after being drilled, it is necessary that he should stand with his shoulders and body square to the front, heels in a line and closed, knees braced up, toes turned out at an angle of 45 degrees, and arms hanging loosely by the side, and straight like a veritable Corporal Trim. There should be no positive change in the upper parts of the body, although the lower limbs can be relaxed when not standing in the ranks. The pupil should always keep his chest advanced and his shoulders pressed back, for if he resumes his original position no object whatever is gained. In the interval between the exercises the pupil may stand at ease by putting the palm of the right hand over the back of the left, and by drawing back the right foot and placing the hollow against the left heel, slightly bending at the same time the left knee. Marching is a very useful exercise, as by it the pupil learns to walk steadily and in regular time; in the slow march the pupil is allowed 65 paces a minute, and in the quick march 116 paces a minute, each pace measuring about 30 inches. The arms should be kept steady, and the first position maintained. In turning, the pupil places the feet in order to turn in the direction indicated; he cannot turn if the heels are square; he must either draw back the foot or advance it the required distance; nor should he be allowed to walk round, but should raise the toes, and turn on the heels. Another useful exercise in expanding the chest and strengthening the arms is the arm exercise, which is done in six different grades, after the manner of dumb-bell exercises. The dumb bell is a short bar of iron, with a knob at each end, to be held in the hand and swung to and fro for exercise. No pupil under eighteen should use dumb-bells above three pounds weight each. Other calisthenic exercises are leaning, lunging, and club exercises (*see* CURVATURE OF THE SPINE). A very handy book on this subject is Mr. T. A. McCarthy's *Calisthenics* (London, 1881).

Cambridge. *See* UNIVERSITIES.

Campe, J. H. (*b.* 1746 in the duchy of Brunswick, *d.* 1818).—A celebrated German writer and pedagogue. After studying theology at Halle, and serving for awhile as chaplain to a regiment at Potsdam, he was in 1777 summoned by the Prince of Dessau to replace Basedow (*q.v.*) in the directorate of the Philanthropinum, which he raised to a high degree of prosperity. He also founded an educational establishment at Trittow, near Hamburg. He was in addition entrusted with the task of reforming the system of education in the duchy of Brunswick. He devoted the latter part of his life to educational literature, in which he was both a successful and a brilliant writer. His works include his *Robinson Crusoe Junior*, 106th edition, 1883, &c., *German Dictionary*, 5 vols., 1807–1812, *Théophron, Collection of celebrated Voyages for the Young*, 12 vols., *General Revision of the School System*, 1785–91, 16 vols. In his educational principles Campe followed closely those of Basedow.

Canada (Education in). *See* LAW (EDUCATIONAL) and UNIVERSITIES.

Carpenter, Mary (*b.* Exeter, 1807, *d.* 1877), was the eldest child of Dr. Lant Carpenter, and sister of Dr. W. B. Carpenter. She was educated with her father's elder pupils. Her work in Sunday school early excited her interest in the poor. From 1829 to 1845 she was occupied with her mother and sisters in a school. After a struggle of some years, in 1854 Parliament passed a bill providing for the establishment of reformatory schools. Meanwhile Miss Carpenter had started one at Kingswood. She was one of the chief promoters of the Industrial Schools Act, passed in 1857. In 1864 she advocated in *Our Convicts* the application of the reformatory system to adult criminals. In her sixtieth year she visited India to inquire into Indian education and prison discipline. She wrote an account of this in 1867, under the title of *Six Months in India.* She made three voyages to India afterwards, and laid the foundation of a system of female education for the country. In 1871 she established 'The National Indian Association' (*q.v.*), and edited its journal. She died suddenly at Bristol, after a life of unselfish devotion to all that is best in education. A good sketch of her work was published in the *Times*, June 18, 1877.

Casaubon. *See* REFORMATION.

Castiglione (Count Baldassare). *See* RENAISSANCE.

Catechetical Method.—Instruction by question and answer, the pupils being required to answer the questions of the teacher. By this means the explanations requisite for the complete comprehension of a subject are discovered and given. Sometimes the answers are committed tc memory from the text-book, and are recited to set questions. Several objections are advanced against this method, the principal being (1) that the pupil, being required only to repeat what is enunciated in the language of others, loses the exercise of his own peculiar faculties; (2) the logical relations of the facts are liable to be overlooked or imperfectly apprehended; (3) that the answer to a question being merely learned, the full idea of the truth, of which sometimes the essential part is contained in a question, fails to be grasped. The catechetical was the method adopted by the early Christians to teach their converts, and especially before the New Testament was written.

Catechumen (Gr. κατηχούμενος).—One who attends a class for instruction, where the teacher imparts his knowledge orally. It had a special meaning as applied to the converts to Christianity who were being prepared for the rite of baptism.

Cathedral Schools. *See* ABBEY SCHOOLS.

Cato the Censor. *See* ROMAN EDUCATION.

Certificated Teachers. — After the establishment of the Committee of Council in 1839, their attention was for years directed to the creation of a body of well educated and skilful instructors. The famous minutes of 1846 (*see* GOVERNMENT GRANTS) called into being two orders of teachers—pupil-teachers (*q.v.*) and certificated teachers. The original certificates of merit (as they were called) were of three classes, known as the upper, middle, and lower, and in each class there were three divisions. The grants which were made to normal schools contemplated a three years' residence, and a student who went through the full course would be rated at the close of the first year in one of the divisions of the lower class, at the close of the second year in one of the divisions of the middle class, and at the close of the third year in one of the divisions of the upper class. A large number of teachers actually at work when the minutes were first issued naturally desired to obtain certificates, and provision was made for them to be examined. The syllabus was elastic, and the class of certificate granted depended upon the difficulty of the subjects taken and the proficiency shown. To certificated teachers the Committee of Council paid a yearly 'augmentation' of salary, ranging, according to class and division, from 15*l.* to 30*l.* for masters, and from 10*l.* to 20*l.* for mistresses. The Revised Code of 1862 swept away this augmentation together with the whole scheme of certificates. Henceforth there were to be four classes—the first three undivided, the fourth divided into an upper and a lower grade. In the lower grade were placed those who passed in the fourth division at the examination; in the upper all who passed in the first, second, or third division. No certificate was issued above the fourth class. Promotion to each of the higher classes successively was obtained by five years' good service. The

New Code of 1871 again changed the scheme of certificates. They were in future to be of three classes, with no sub-grades. Candidates who passed in the fourth division at the examination received certificates of the third class; candidates who passed in the first, second, or third division received certificates of the second class. No certificate was issued above the second class, promotion to the first being only obtained by ten years' good service. The code was recast under the direction of Mr. Mundella in 1882, but the rules respecting certificates were little altered. The full course of preparation for a teacher extends over six years—in a sense, over eight years. First come four years of apprenticeship as a pupil-teacher, with a Government examination at the end of each. Then comes the examination for queen's scholarships. Candidates who pass this high enough on the list enter a training college, where they stay for two years, undergoing an examination at the end of each—the 'first year's' and 'second year's certificate examination' respectively. The names of the successful candidates are arranged, according to the degree of success, in three divisions. A student who has completed his training is to all intents and purposes a certificated teacher, but he does not actually receive his certificate (or 'parchment,' as it is familiarly called) till he has been under 'probation' for at least eighteen months. He must in one school obtain from the inspector two favourable reports with an interval of a year between them; if the first be not preceded by six months' service it cannot count, and a third must be obtained before the parchment is issued. Certificates are of three classes. Candidates who pass the second year's examination obtain certificates of the second class. At each inspection of the school the inspector enters upon the certificate a concise report on the teacher's work; when ten good reports have been obtained the certificate is raised to the first class, and no further reports are entered on it. Candidates who pass the first year's examination receive certificates of the third class, which can only be raised by passing the second year's examination. The holders of third-class certificates are not allowed to take charge of pupil-teachers. Much of the course described is optional. The only compulsory parts are the passing of the first year's examination and the serving of a period of probation. To begin with, though as a fact most of the candidates for admission into training colleges have been pupil-teachers, the examination may be taken by 'open queen's scholars,' that is, by candidates who have not been pupil-teachers. The apprenticeship does undoubtedly serve to give teaching skill and the confidence which comes of skill, but it is a question whether the same result might not be more certainly obtained if the practical training came somewhat later. Then the certificate examination of both years is open to 'acting teachers,' that is, to candidates who have not been through college. It is easy to suggest improvements in the existing training college system, and it is true that some untrained teachers have been highly successful while some trained teachers have utterly failed; but there is no denying that, other things being equal, the trained teacher is superior to the untrained, and that till the standard for certificates is considerably raised the education given in elementary schools must too often be narrow and mechanical. At the date of the report of the Committee of Council for 1885–6 there were 40,340 certificated teachers at work. Of these 43·8 per cent. were untrained, while 5·6 per cent. had been trained for less than two years. There are no figures to show what papers were taken by the untrained teachers, but the published lists prove that a majority took the first year's; yet, by a gross anomaly that existed till the end of 1882, untrained candidates who passed in the third division on the first year's papers, and candidates who had been trained for two years and passed in the first division on the second year's papers, received the same class of certificate. (*See* TRAINING OF TEACHERS.)

Chaldea. *See* SCHOOLS OF ANTIQUITY.

Chancellor. *See* RECTOR.

Channing, William Ellery (*b.* at Newport, Rhode Island, 1780, *d.* Boston, 1842). —An eminent American Unitarian theologian, educationist, and writer; was educated at Harvard College, and obtained great distinction by his eloquence and his writings, especially his review of Milton's *Treatise of Christian Doctrine*, and review of Scott's *Life of Napoleon*. His chief educational works were, *On Self Culture*, and *The Elevation of the Working Classes*. Channing regarded education as the means for the perfection of the individual, and

supported the efforts of Horace Mann in spreading education among all ranks of society. Not only did these ideas triumph in the United States, but also spread in various countries of Europe.

Character (Gr. *χαρακτήρ*, a mark) means, when applied to a human being, the peculiar group of mental and moral qualities by which he is distinguished as an individual from others. In this sense it is equivalent to Individuality (which *see*). Its natural basis is also marked off as idiosyncrasy. In a restricted and ethical sense character means a good or virtuous condition of the mind, and especially the emotional dispositions and the will. Moral character is the highest result of moral development, being the outcome of a persistent series of efforts in doing right. It corresponds with what Kant calls a good will. Character has its chief support in moral habit, which implies a fixity of purpose in certain definite directions, as the pursuit of truth and of justice. But it includes more than a sum of habits, viz. a conscious self-subjection to duty, and a readiness to take pains to reach the truest and highest conception of duty. This moral character, though conceived abstractedly as a common attainment for all, is in every case vitally connected with, and in a sense an outgrowth from, individual character. In truth, if the highest duty is to make the moral best of ourselves, it is evident that individuality has its rightful claims within the limits of moral growth. The educator, as a former of character, has no doubt to insist on a certain uniformity of moral action and of motive. Nevertheless, his ultimate aim should be to harmonise the claims of the moral law and of individuality, by helping the child to develop to the utmost its own distinctive good qualities. (*See* Mrs. Bryant, *Educational Ends*, introd. and pt. i.; A. Martin, *L'éducation du caractère*; Buisson's *Dictionnaire de Péd.*, article 'Caractère'; Schmidt's *Encyclopädie*, article 'Charakter.')

Charity Schools.—Schools endowed for the purpose of giving an elementary education to the children of the poor. A large number of such schools were founded in the reign of Queen Anne, and are to be distinguished from the endowed grammar schools (*q.v.*) founded about the time of the Reformation. The grammar schools appear to have been designed generally for the purpose of affording means of higher education to all who might be willing to learn. For this object it was provided that the poor should be exempted from all payment, or, lest the poor should still be neglected, that no fees should be paid by any. The character of the teaching has, however, usually been of a kind not suited to the wants of the working classes. Charity schools, on the other hand, were intended mainly for the use of that class of the population which now attends public elementary schools, and for the purpose of affording them that sort of education which is now provided for all by compulsory laws. The Select Committee on the Endowed Schools Act, appointed in 1886, recommend that when a new scheme is made for an endowed elementary school, it should aim to provide the children of the working classes with a practical instruction suitable to their wants in the particular circumstances of each locality. The purpose of such a revision, in the opinion of the committee, should not be the relief of the school rate, but the endowment should be used as a means of providing some educational benefits which the poor would not enjoy if the endowment did not exist; as, for instance, in rural districts, industrial agricultural instruction suitable to the labouring population.

Charlemagne. *See* MIDDLE AGES (SCHOOLS OF).

Charterhouse. *See* PUBLIC SCHOOLS.

Cheerfulness.—This term describes a more or less permanent condition or attitude of mind, which is at once calmly pleasurable and promotive of activity, mental and bodily. It contrasts, on the one hand, with all unhappy states of mind, as fretfulness, despondency, and what is known as low spirits; and, on the other hand, with all states of pleasurable excitement, as boisterous mirth. It may be regarded as the product of three factors: 1. Of these the first is the influence of the whole bodily condition, corresponding to what physiologists and psychologists are in the habit of describing as the vital sense, or the feeling of well-being, and its opposite. The profound influence of varying bodily conditions, particularly those of the vital organs, in raising or depressing the mental tone, is strikingly illustrated in mental disease, and is clearly observable in children, whose whole mental life is so intimately connected with bodily states.

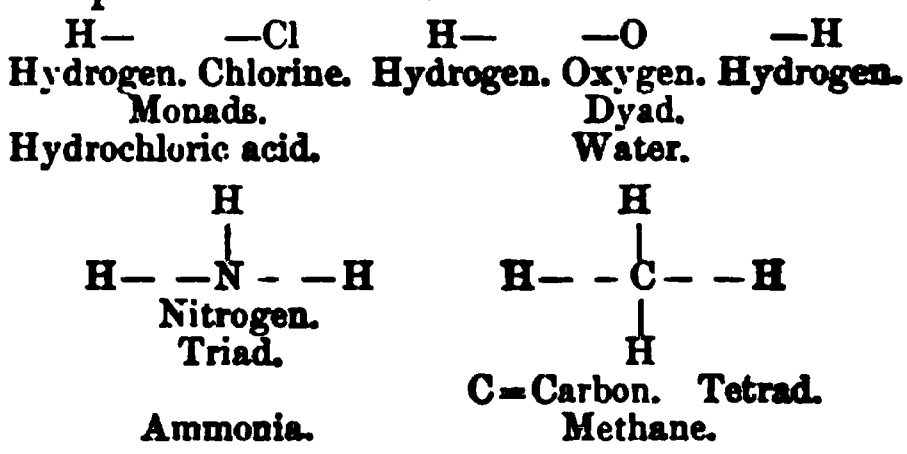
What we mean by a happy natural disposition or cheerful temperament probably has for its chief ingredient a well-organised and healthy *physique*. 2. The second main influence is that of the surroundings, physical and moral. A happy, cheerful condition of mind in early life presupposes a sufficiency of interesting objects and channels of activity. A bright, pretty environment, whether out of doors or in doors, exercises a marked influence on the child's spirits. Agreeable openings for activity, and the presence of bright companions and playmates, are a further condition of this desirable mental state. The working of unconscious imitation is strikingly exemplified in the infectious character of cheerfulness. 3. In its highest form as a permanent habit cheerfulness represents the result of a series of voluntary efforts. By trying to rise above anything in our circumstances which is painful and depressing, and forming a habit of looking by preference on the bright side of things, we are all of us able to some extent to make good a deficiency in natural disposition. The educator is concerned with the promotion of cheerfulness in the young, in the interests both of intellectual and moral training. Since a gentle flow of pleasurable feeling is most favourable to mental activity (*see* PLEASURE), the school-teacher should make it one of his main objects, by the choice of attractive surroundings, an agreeable manner, &c., to maintain a cheerful tone among his pupils; and it is not one of the least merits of the Kindergarten (*q.v.*) that it so amply fulfils these conditions. Further, the moral educator should early begin to exercise the child in such a control of the feelings and the thoughts as will best conduce to a habit of cheerfulness, cf. article SYMPATHY. (*See* Fitch, *Lectures on Teaching*, p. 16, and articles 'Frohsinn,' 'Aufmunterung,' in K. A. Schmidt's *Encyclopädie*.)

Chemistry.—The science of Chemistry seems to have been first pursued in Egypt, whence it takes its name. According to Plutarch Egypt was anciently named Chemia, on account of the blackness of its soil. 'The same word,' say Roscoe and Schorlemmer, 'was used to designate the black of the eye, as the symbol of the dark and mysterious. It is therefore pretty certain that 'chemistry' originally meant Egyptian—or secret—knowledge, as it was afterwards termed the secret or 'black art' (*Treatise on Chemistry*, vol. i. p. 4). Like other sciences, chemistry took its rise in fanciful and superstitious ideas: as astronomy had its rise in astrology, so chemistry grew out of alchemy; and the ancestors of the Daltons, Boyles, and Joules of modern chemistry were the searchers for the elixir of life and the philosopher's stone in ancient times and in the Middle Ages. Of all the sciences that of chemistry demanded most of courage from its votaries, and the experiences of inquiring chemists who, greatly daring, put together and treated unknown substances and awaited the results, form as exciting reading as the adventures of travellers in unknown lands. Thrice was Roger Bacon stretched on the floor of his cell for dead by unexpected explosions; many lost eyes and hands, and life itself, in the perilous experiments out of which has grown our modern knowledge of the constitution of material things.

Chemistry is often described as a branch of molecular physics, i.e. of the science which deals with the relations that exist, not between bodies, but between the molecules, or particles, of which bodies are composed. It has for its domain the investigation of the ultimate constituents of all substances, living and non-living, of the laws of the combination and disassociation of these constituents. There is no science with wider bearings on human life; since the time of Paracelsus (1493–1541) it has been the foundation of medicine; on it scientific agriculture is based; manufacturing industries owe to it their great expansion; sanitary science is one of its latest births; by the synthesis of foodstuffs it is beginning to open up hitherto undreamed-of possibilities in the way of scientific alimentation. As an instrument in the education of the young it has been but too much neglected, for it cultivates keenness of observation, accuracy of recordal, strength of memory, and patience of investigation; in its theories it cultivates the reasoning faculties, while in its practice it trains the eye and the hand.

Robert Boyle (1627–1691) may perhaps be regarded as the father of modern chemistry. He first laid down the distinction between elements and compounds, and discovered the relation existing between the pressure on a gas and its volume; the statement of the fact that the volume of a gas varies inversely as the pressure

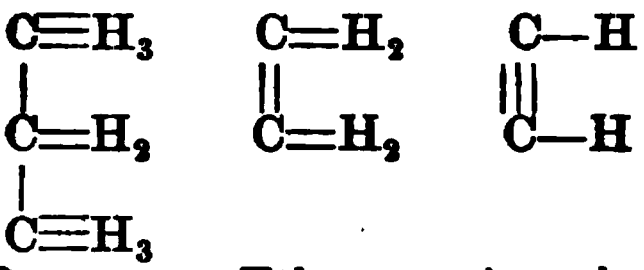
upon it, other circumstances remaining the same, is known as 'Boyle's law' (sometimes as Boyle and Mariotte's law). Joseph Priestley (1733-1804), on August 1, 1774, discovered oxygen by heating mercuric oxide, a discovery said also to have been made independently in France by Lavoisier, and in Sweden by Scheele. Henry Cavendish (1731–1810), utilising the observation of Priestley that some water had been produced when electric sparks were passed through a mixture of hydrogen and air, succeeded in 1781 in the synthesis of water, thus determining its composition. To these discoveries Rutherford added that of nitrogen, and Scheele that of chlorine—the latter also preparing a number of organic substances. Lavoisier (1743–1794), taking up the discoveries of his contemporaries and adding thereto his own, laid down the true theory of combustion, swept away the old notions of phlogiston (a kind of combustion-soul resident in all combustible bodies), and by a series of admirable monographs placed chemistry on a sound basis of fact, and established the indestructibility of matter. John Dalton (1766–1844) in 1803 issued, for the first time, a table of the 'relative weights of the ultimate particles of gaseous and other bodies,' and in 1807 his 'atomic theory' was made known to the world. This theory posits the 'atom,' or indivisible particle, as the fundamental unit of the chemical element; each atom has its own weight in relation to other atoms. Hydrogen being the lightest known element, the weight of an atom of hydrogen is taken as one, and the weight of every other atom is a multiple of that of hydrogen. Thus, oxygen being sixteen times as heavy as hydrogen, the atomic weight, or the 'weight number,' of oxygen is 16. As an atom is the smallest particle of an element that can enter into combination, this relative weight of oxygen is the least weight with which it can enter into combination. Atoms are further classified according to the number of other atoms with which they combine. The combining power of hydrogen is as one, and elements that combine with hydrogen atom for atom are called monads. Elements one atom of which combines with two of hydrogen are dyads, those that combine with three of hydrogen triads, and so on. A line is sometimes used to denote this combining atomicity, and the term 'chemical bond' is used to describe it; then we obtain graphic formulæ of compounds. Thus:—



The letters used are the first letters of the names of the elements, and are called their symbols. When all the bonds of the elements in a compound are satisfied, i.e. joined to others, the compound is stable; when any bond is unsatisfied, the compound is unstable. When to the atomic theory of Dalton was added, in 1808 by Gay Lussac, and in 1811 by Avogadro, the law of combination of gaseous bodies by volume, the foundations of chemistry may be said to have been completed.

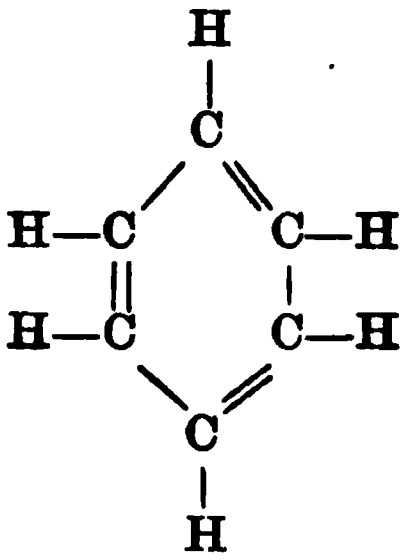
Chemistry was for a long time divided into two great branches, inorganic and organic. The first comprised all substances which were not produced by living things; the second all products of animal and vegetable activity. The first could be artificially produced, the second could only be produced by vital action. This distinction was broken down in 1828 by Wöhler, who produced urea artificially. Alcohol was soon after made in the laboratory, and since then hundreds of organic substances have been manufactured by the chemist. In 1837 Wöhler described organic chemistry as an 'endless and pathless thicket, in which a man may well dread to wander.' The thicket is now pierced by paths easy to travel. But it is no longer 'organic' chemistry, for the old gulf is bridged. It is now 'the chemistry of the carbon compounds,' for the presence or absence of carbon, with its strange powers of self-association, is now the dividing mark of the two great branches of chemistry.

The chemistry of carbon compounds has again two main divisions—that of the paraffin, olefine, and allied groups, and that of the aromatic hydrocarbons. In the first series the carbon atoms are linked in chains; in the second they form a closed ring, called, from the name of its proposer, Kekule's ring. Thus we have as types of the one:



Propane. Ethene. Acetylene.

As type of the other :



Benzene.

In inorganic chemistry the progress has been great, though less striking. In 1837 fifty-three elements were known ; in 1887 the number had risen to seventy, and it is alleged that some twenty more have been discovered in rare Scandinavian metals by Krüss and Nilson. As yet, however, 'inorganic' chemistry has failed to yield generalisations similar to those of 'organic,' and it remains a mass of somewhat disjointed facts. The question of the possibility of decomposing the bodies, now regarded as elementary, is engaging the attention of chemists. Crookes has suggested that all chemical atoms are but multiples of a primeval substance, 'protyle,' but his theory still lacks experimental verification.

In teaching chemistry it is important that the teacher should bear in mind William Harvey's remark, that those who fail to obtain by means of their senses and observation an exact knowledge of the objects with which they are concerned fill themselves simply with 'inane fancies and empty imaginations.' As Professor Huxley says, commenting on this remark of Harvey's, 'You may tell a student that water is composed of oxygen and hydrogen ; you may give him the formula written in pretty letters, and show him complicated signs with bonds between them, and all the rest of it ; and by so doing, if I mistake not, you will fill his mind with the inane formulas and empty imaginations of which Harvey speaks ; or you may take the complete substance—a glass of water—and without going one iota beyond common language and matter of observation you may get out of it the elementary bodies of which it is composed, show him the process, and thereby fix in his mind for ever a complete, real, physical conception, on which he can build.' (See *Treatise on Chemistry*, by Professors Roscoe and Schorlemmer, 3 vols. ; *Chemistry of the Carbon Compounds*, by Professor Schorlemmer ; Watts's edition of *Fownes' Organic and Inorganic Chemistry*, 2 vols. ; *Organic Chemistry*, by H. F. Morley.)

Childhood (Characteristics of).—Child-nature forms the special material on which the teacher has to work, and, as such, the study of its characteristics is a matter of prime concern. In attempting to define these we must be careful to select only common and essential traits of childhood. Children differ much less from one another than adults ; nevertheless, individual differences begin to present themselves from the first. (*See* INDIVIDUALITY.) The child is to be regarded as a distinctly human being, in whom the higher attributes, intellectual and moral, that mark off man from the lower animals are nascent, and the educator has first of all to view the child in this light. At the same time he has to regard the child at its great distance from adult man and as a link of connection between the species and the animal world and nature as a whole. In order to illustrate this we must distinguish between the several modes of activity or functions of the human organism. These may be conveniently divided into (*a*) the vegetative functions, by which the physical framework is being built up and enlarged by exchange of materials with the environment ; (*b*) animal functions, sensibility and motility, by which impressions are received from without, and movements executed in adjustment to these impressions ; and (*c*) the specially human functions, which make up what we call consciousness or mental life in its higher developments of intelligence or thought, emotion and will. The child is broadly marked off from the adult by the preponderance of the lower functions over the higher. To this extent it may be said to belong more to nature and the animal world than to humanity. At first its life is largely physical. The varying states of satisfaction and dissatisfaction connected with fluctuations in the bodily life make up its pleasure and its pain. The first activities of the organs of sense and movement are

directed towards the satisfaction of physical wants. The first actions are prompted by instincts which it shares with the lower animals. At the same time the child is distinguished from the mere animal from the beginning. This is seen partly in the fact that instinct plays a very limited part. While the newly-hatched chicken can not only run about, but execute nice muscular adjustments in the act of pecking, the child has to learn the use of its eyes, its hands, and its feet by a slow and difficult process of trial. The very helplessness of infancy itself, contrasting in its degree and in its duration with the corresponding state of the lower animals, is a distinctively human feature. For, according to the evolutionist, the prolonged dependence of the human offspring on others' protection and aid is closely connected with the growth and deepening of the social feelings in the past history of the race. From the very first, too, the child displays the germ of a freer spiritual activity. Thus, the infant shews itself what the animal never shews itself, a perfectly disinterested observer. It looks at and admires things which have nothing to do with its physical needs, and shows the first crude germs of a scientific curiosity in examining the objects that are put into its hands. The whole field of children's play again is a striking illustration, both in its pure disinterestedness and its mimicry of adult action, of their superiority to the animal. A proper understanding of the relation of the human to the sub-human in the child is essential to its proper management and education. Thus the parent has to watch the effect of bodily states on the temper of the infant. The teaching of Pestalozzi and Froebel as to the true method of infant-training is based on the recognition of the truth that the use of the organs of sense and of movement is the starting point in the development of mind. Turning to the more strictly mental characteristics of the child, we see that it contrasts with the adult in respect of each of the three phases, intelligence, feeling, and will. With respect to the first, sense knowledge, i.e. the observation of outer objects, makes up the chief part of the intellectual life, the higher activities of imagination and reason appearing only in very crude form and in close connection with sense-perception. The preoccupation of the child's mind with outer things is a serious obstacle to the growth of that reflection upon self which is necessary to moral development. At the same time the child's advancing knowledge is secured by an insatiable curiosity, which shews itself on the one hand in the direct examination of objects of sense, and on the other hand in ceaseless questionings of others. The teachableness of the child arises from this abundant inquisitiveness, aided by a belief in others' superior knowledge, which is only the expression in the intellectual sphere of its dependence on others. (*See* CURIOSITY.) The feelings of the child again are characterised by the preponderance of the sense-element, and the absence of those processes of imagination and thought which are involved in all the higher emotions, as the finer sort of sympathy, the love of truth, and the sense of justice. The violence of children's feelings is closely connected with the excessive force of sense-impressions, the absence of reflection, and the want of will-power in checking and controlling the outburst. With this turbulence we have a striking degree of volatility and capriciousness, which contrasts with the lasting affections and dispositions of later life. The dependence of childhood expresses itself in the region of the feelings, not only in the instinctive love of society, but in the natural desire for others' good opinion. (*See* EMOTIONS.) Lastly, we see that the child's power of voluntary action is narrowly circumscribed by its inability to represent the more remote consequences of its actions and to check or inhibit the solicitations of the immediate present. The dependence of childhood shows itself here as the instinct of obedience, by which the will, under favourable conditions, easily and without much painful friction subordinates itself to a superior will. (*See* WILL.) (For a detailed account of the characteristics of children, *see* the works on child-psychology by B. Perez, *First Three Years of Childhood*, &c., Prof. Preyer's *Die Seele des Kindes*, also *Child and Child-Nature*, by the Baroness Marenholtz-Bülow; cf. article 'Enfance' in Buisson's *Dictionnaire de Pédagogie*.)

Chrestomathic System. *See* BENTHAM, JEREMY.

Church School Company. *See* EDUCATION OF GIRLS.

City and Guilds of London Institute. *See* TECHNICAL EDUCATION.

Civil Service. *See* EXAMINATIONS.

Classical Studies.—Since the revival of learning the place of honour in the educational systems of Europe has been occupied by the study of the classics. The word 'classics' (*scriptores classici*) means properly 'of or belonging to the *first* class,' or 'worthy of being classed'; cf. the Oxford distinction between 'pass' men and 'class' men. But the word has been narrowed down to denote the writers of Greece and Rome. During the period of scholasticism (until the end of the fifteenth century) interest in Greek and Latin literature had been decaying; the impulse given by Charlemagne in founding schools for the study of Latin and also of Greek died out, and Latin was cultivated for practical purposes only, and as a matter of necessity; for Latin was the only universal medium of communication, and was the language of the Church and the law. The Renaissance—that great reaction against mediævalism—resulted in the first place in a revived study of Greek and Latin; the classics were studied in the spirit of Schiller's poem, *Die Götter Griechenlands*, as embodying the wisdom and beauty of a lost order of things, as a voice from a higher world. For the 'practical' study of Latin was substituted the study of Greek and Latin literature. At the present day the classics may be said to be engaged in the struggle for existence. Both in England and abroad there is a strong party claiming as a right the abolition of the classics, or at any rate their relegation to a subordinate position. How this movement originated is a question which we need not discuss here. For the present we are concerned with (1) the arguments which may be advanced in defence of it; and (2) the counter-arguments in defence of the classics.

The main contention of the supporters of a 'modern' education is that so many other subjects of modern growth demand recognition in a scheme of education that time cannot be spared for the long discipline of Greek and Latin. The time devoted to classics would be sufficient to embrace a complete cycle of the physical sciences. Modern languages are a discipline in language, and might, from that point of view, make good in part, if not entirely, the loss of the classics, while their practical utility cannot be left out of sight by a commercial nation like ourselves. The study of English literature would, it is maintained by Professor Huxley, be a far better school of literary taste and culture than that of the writers of Greece and Rome; 'the ascent of Parnassus is too steep to permit of our enjoying the view,' and few reach the top. What there is of good in the classics could be better studied, from the æsthetic point of view, in translations. 'I should just as soon think of swimming across the Hudson in a coat of mail when I can take a penny steamer,' cries Emerson, 'as of studying the classics in the original when I can read them in the admirable translations of Mr. Bohn.' 'The classics,' says Professor Huxley, 'are as little suited to be the staple of a liberal education as palæontology.' The great aim of education, he holds, is to impart a knowledge of the universe as governed by law. Nature he compares to a beneficent angel playing a game of chess with man, in which defeat means death. Science is a knowledge of the laws of the game. Thus the demand is for what has been called an 'autochthonous' education—an education rooted in modern life and modern needs. That such an education is a possibility is proved by the example of Greece herself. From the point of view of training, Mr. H. Spencer and Mr. Ruskin maintain that 'the science which it is the highest power to possess, it is also the best exercise to acquire'; in fact, that there is a sort of pre-established harmony between utility and educative value.

On the other hand, the classics are not without powerful champions. John Stuart Mill, not himself a blind worshipper of 'authority,' held most strongly that nothing could replace Latin and Greek as educational instruments. He defended them mainly on the score of formal training. 'The distinctions between the various parts of speech are distinctions in thought, not merely in words. The structure of every sentence is a lesson in logic. . . . The languages which teach the laws of universal grammar best are those which have the most definite rules, and which provide distinct forms for the greatest number of distinctions in thought. In these qualities the classical languages have an incomparable superiority over every modern language;' it might be added over Hebrew and Sanskrit. Again, in perfection of literary form the ancients are pre-eminent; the 'idea' has thoroughly penetrated the form and created it. Every

word is in its right place—every sentence a work of art. Modern literature lacks the simplicity and directness of the ancient classics. What they would have expressed in a single sentence, a modern writer will throw into three or four different forms, presenting it under different lights. In fact, Mill claims for classical literature what Hegel claimed for classical art, that the form and the matter are adequate one to the other. But even though the stage of literary enjoyment be not reached, there are many who hold that the training involved in a mastery of the elements of Latin (*q.v.*) is invaluable. Modern languages are too like our own to give the degree of emancipation from the thraldom of words which comes from comparing classic with English modes of expression. To translate 'I should have spoken' into *dixissem* is more of a lesson in thought than to translate it into *Ich würde gesprochen haben*, or *J'aurais dit*, because the form is more different. Still greater stress is laid upon the educational value of the higher kinds of composition. The recasting of the thought, the exercise of the *vis divinior* involved in clothing an idea in Greek or Latin, has been called the 'microcosm of a liberal education' (A. Sidgwick). Perhaps the strongest testimony of modern times to the value of a classical education is the Berlin Memorial of 1880, addressed to the Prussian Minister of Education, on the question of admission of *Realschüler* (*q.v.*) to the universities. This memorial represents the unanimous views of the members of the faculty of philosophy (i.e. arts and sciences), and was signed by Hoffmann, Helmholtz, Peters, Zupitza, &c., as well as by the classical professors. The memorial insists upon the value of classical philology in cultivating 'the ideality of the scientific sense, the interest in science not dependent on nor limited by practical aims, but as ministering to the liberal education of the mind and the many-sided exercise of the thinking faculty.

To hold the scales between views so strongly held and so ably maintained is a difficult task, but must be attempted here. In the first place, it may be well to dispose of certain fallacies which rest upon popular prejudice rather than upon any basis of reason or experience. 1. That the classics train only the memory, not thought or observation. It may fairly be replied that though memory is involved, it is not necessarily involved more than in any other discipline. The learning of grammar by rote is falling out of favour; the dictionary meanings of words are learnt not by a conscious exercise of the portative memory, but in the same way as the names of flowers or animals in studying natural history. The syntactical structure of Latin and Greek is more 'logical' in its character than anything in the discipline of physical sciences. Observation—not, of course, sense-observation—is constantly exercised in translation and composition. Nor is it practically found that classical scholars are less capable, as thinkers, than physicists. 2. That classics foster a blind adherence to authority. But no one nowadays holds that the classic writers are all equally worthy of admiration, or claims any special consideration for the opinions which they express. Grammar (*q.v.*) is not the arbitrary creation of schoolmasters, but the record of law discovered by patient observation, and liable to revision by any competent inquirer. Mill held precisely the opposite opinion as to the effects of classical study. 3. That there is something grotesque and mediæval in classical studies. It has been shown above that so far from being mediæval, the classics have established their position in our schools and universities by a revolt against mediævalism. 4. That the method of teaching the classics cannot be further improved. So far is this from being true, that the scientific problem of constituting the rules of grammar is still only in process of solution, and the existence of the didactic problem of determining what and how much should be taught at each stage has only begun to be realised in its full import.

On the other hand, the champions of physical science do not always have fair play. It is popularly supposed that 'science' consists in accumulation of information, such as that when a candle burns water and carbonic acid are produced, and that the good of physical science may be got by studying its results in books. This is to misunderstand and underrate the discipline of the laboratory. The value of training in the physical sciences is not to be measured by the possession of so many useful facts about gases, plants, and animals. If rightly pursued, it involves not only a power of sense-observation, without which a man must be considered as so far

maimed and defective, but also a habit of mind and attitude towards the universe, which have a very direct bearing upon both the criticism and the conduct of life. The man or woman who has physiological knowledge will be so far in a better position to make a study of health and to bring up children wisely; will be less likely to ignore the 'laws of the game,' to believe in the domination of chance, and to make rash experiments in amateur medicine. For to be scientific is to know one's limitation, and this is a power.

The practical question is, to what extent can we afford to make education as complete as possible? and, supposing that something has to be sacrificed, what is it best to sacrifice? That the literary side of education cannot be even relatively complete without classics may be taken as demonstrated. Our study of Greek and Latin is not so much the study of a foreign culture as the study of our own past: so intimately is modern culture connected, through the Renaissance, with Greece and Rome. We stand to the classics in a different relation from that in which they stood to anterior civilisations. Greek culture was, generally speaking, autochthonous; modern culture is not. And the man who has no Latin or Greek finds himself unable to prosecute his literary studies far, or to be a master even in the literature of his own country. Still the question remains, can we afford to purchase this completeness at the price which it costs—a less complete development in the direction of modern studies? The answer to it must depend upon the aim which pupils set before themselves in life—upon utility in its broad sense—and upon the length of the school course. For those whose tastes are literary or artistic, classics may be the most 'useful' of studies; for those who have to contemplate an early entrance into practical pursuits, they may well be a luxury of too high a cost. At the present day the classics retain a firm hold of our higher English schools, and Latin, at any rate, is becoming recognised as an important item in the education of girls. The class lists of the universities show no falling off—if anything an increase—in the number of those who devote themselves to classics. At the same time there are signs which some interpret as presaging a change. The recent circular letter of the head-masters of Winchester, Harrow, and Marlborough (August 1887) to principals of preparatory schools, urging that Greek should not be begun till the age of eleven, though intended not to discourage, but to further the study of Greek, is regarded by some as the first step in the direction of abandonment of the classical lines. An exclusively classical education has had its day, and the classics will doubtless have to take their place among other subjects for the future. If it is true, as many competent teachers think, that Greek and Latin may be begun at a later age without any loss of ultimate proficiency, then those who support this change are the true friends of classical education. (*See* articles LATIN, GREEK, and SCIENCE TEACHING.)

Classification.—Two distinct ideas are conveyed by this term. The first is the classification (sometimes called grading, though not in the sense in which that word is used in America) of *a school*, in relation to other schools, according to its aims and the range of ages between which it receives scholars. In this sense schools would be classified as (*a*) Elementary; (*b*) Secondary. Elementary schools would be further classified into (1) infant; (2) boys and girls (mixed or separate); (3) higher grade; (4) technical. Secondary schools into (1) the nine great public schools (peculiar to England) specially reported upon by the Royal Commission of which Lord Clarendon was the chairman; (2) endowed, private, and proprietary schools reported upon by the Schools Inquiry Commission; 3. Advanced, technical, or trade schools. In its second meaning the term refers to the classification of *scholars* (or grading, in the American sense of the word), and covers such points as (1) the method of division of the scholars into classes; (2) re-classification for particular subjects; (3) mode and kinds of promotion; (4) method of staffing, whether there is a separate teacher for each subject, or for each class in all subjects; (5) bifurcation into classical and modern 'sides,' or departments, in the same school.

Classification of schools.—(*a*) *Elementary.* The term 'elementary school,' under the Elementary Education Act (England), 1870, means a school, or department of a school, at which elementary education is the principal part of the education there given, and does not include any school, or department of a school, at

which the ordinary payments in respect of instruction for each scholar exceed ninepence a week. A 'public elementary school' is defined by the same Act as an elementary school which is conducted subject to a conscience clause, and in accordance with the conditions required to be fulfilled by an elementary school, in order to obtain an annual Parliamentary grant. It must also be open at all times to the inspection of any of her Majesty's inspectors. Other elementary schools recognised by the Education Acts are included with public elementary schools in the term 'certified efficient schools.' Such schools are: any workhouse school certified to be efficient by the Local Government Board, any public or State-aided elementary school in Scotland, any national school in Ireland, a certified day industrial school, and any elementary school which is not conducted for private profit and is open at all reasonable times to the inspection of her Majesty's inspectors, and requires the like attendance from its scholars as is required in a public elementary school. The definition of a public elementary school, taken in conjunction with section 13 of the Code, which provides that no attendance is, as a rule, recognised in a day school for any scholar under three years old, or for any scholar who has passed in the three elementary subjects in the seventh standard, virtually fixes the ages of three and thirteen as the average inferior and superior limits of age in such a school. But children are frequently admitted while under three years of age, and as seven years is the earliest age at which a scholar can be examined in the first standard, and many are older than that, it follows that children of fourteen, fifteen, and even sixteen years of age are to be found in public elementary schools who have not passed the seventh standard. On the other hand, the average age at which children leave school is lowered by the fact that the standard, the passing of which qualifies for total exemption from school attendance, is rarely higher than the fifth by the by-laws of the local authority, and is frequently only the fourth. Infants' schools are usually limited to scholars under seven years of age, but young children who have not passed Standard I. are frequently retained in such schools until seven or eight years of age. *Higher grade elementary schools.*— Various schemes have been put in operation by the school boards in the more populous centres for 'higher grade' elementary schools. The purport of these schemes has been either (1) to provide a school for children whose parents are able and willing to pay a higher fee than that ordinarily paid in the place, in return for which they are offered a somewhat enlarged curriculum by the introduction of more class or specific subjects. It is found possible to work such an extended course, owing to the greater regularity of the scholars, the greater attention given by the parents to the home-lessons, and the greater age up to which such parents consent to keep their children at school. These schools would contain classes corresponding to *all* the standards of the Code. Or (2) to collect into one central school the scholars in the highest standards (frequently very few in number in a single school) from a group of schools under a school board, and, with or without an increased fee, to give them the advantages of education under these more favourable conditions in the form of a wider course, or a special technical course (that is, workshop instruction, drawing, machine construction, chemistry, &c.), suited to the probable careers of the scholars on leaving school for work or business. These schools would contain classes corresponding only to the higher standards, the fifth or sixth, and upwards.

(*b*) *Secondary schools.* — This term covers all schools which give an education between the elementary or primary schools on the one hand, and the universities on the other. At the top of the list would come, for England, the nine great public schools of Eton, Winchester, Westminster, Charterhouse, St. Paul's, Merchant Taylors', Harrow, Rugby, and Shrewsbury. Then would come the schools, whether endowed, private, or proprietary, which the Schools Inquiry Commissioners divided into three grades, defined by the length of time during which parents are willing to keep their children under instruction. 'It is found,' say the commissioners (*Report*, vol. i. p. 15), 'that, viewed in this way, education, as distinct from direct preparation for employment, can at present be classified as (1) that which is to stop at about fourteen, (2) that which is to stop at about sixteen, and (3) that which is to continue until eighteen or nineteen; and for convenience we shall call

these the third, second, and the first grade of education respectively.' Parents who desire first-grade education are of two kinds: (*a*) those of ample means, whose wish is to widen education, and on whose behoof, therefore, 'bifurcation' into modern language and science sides has been adopted at some of the great schools; and (*b*) those of good education, but confined means, whose wish is to cheapen education. Parents who desire second-grade education are also of two classes: (*a*) those whose children are to enter professions requiring early special training; (*b*) those of straitened means, who are described as, in the main, rejecting or being indifferent to Latin, and desire for their children a thorough knowledge of subjects which can be turned to practical use in business, i.e. English, arithmetic, the elements of mathematics, some science, one or more modern languages. 'The education of the first grade, which continues until eighteen or past, and that of the second grade, which stops at about sixteen, seem to meet the demands of all the wealthier part of the community, including not only the gentry and professional classes, but all the larger shopkeepers, rising men of business, and the larger tenant-farmers. The third grade of education, which stops at fourteen, would be sought by the smaller tenant-farmers, the small tradesmen, and superior artisans' (*Report*, vol. i. p. 20). The need of this class is summed up as a minimum, 'very good reading, very good writing, very good arithmetic.' In the larger and more enterprising centres of population this class of persons is found more frequently to desire second-grade than third-grade education, and in fact either to rest contented with the elementary education given in the board schools, or, if they require anything further, to seek it at once in a second-grade school. As an illustration of this, it may be mentioned that the third-grade schools established by the commissioners at Birmingham on the foundation of King Edward VI. were found to be unnecessary, and were abolished after a few years' trial, and have since been replaced by additional second-grade schools. Secondary schools of the character of advanced technical or trade schools, such as the École Centrale at Lyons, or the Higher Trade Institute at Chemnitz, do not exist at present in England; but their establishment has been strongly urged by the Royal Commissioners on Technical Instruction (2nd *Report*, vol. i. p. 528).

Classification of scholars.—When the scholars of a school are divided up into classes in such a way that each class is composed of scholars of nearly equal attainments, they are said to be classified, or, in the United States, graded. The evidence of equality of attainments may be arrived at by taking one subject of instruction, or several cognate subjects, or all the subjects of the school course, into consideration. Thus, there may be in a school only one classification, or, on the other hand, as many classifications as there are subjects of instruction. In English elementary schools, which are guided so largely by the 'standards' of examination laid down for her Majesty's inspectors, it is usual to find only one classification for all subjects, viz. that by standards, and the scholars in a particular standard constitute a class which usually goes by the name of the standard the syllabus of which they are working during the year. In good secondary schools it is usual to have at least two classifications, one for general subjects, including divinity, English, Latin, French (and German), history, and geography, and another for arithmetic and mathematics. Further re-classifications may take place for science and for drawing. The limit to the number of re-classifications is largely determined by the nature of the staff, and by the facilities afforded by the school premises for rapid and quiet movements of the scholars. Promotions from class to class take place annually in public elementary schools immediately after the annual inspection, and, as no scholar who has passed in two out of the three elementary subjects can, except under very special circumstances, be presented for examination in the same standard a second time, the whole class (or standard) is promoted bodily to the work of the next class (or standard). But in secondary schools promotions are usually at least half-yearly, and frequently terminal (i.e. three times a year). The standard of the work of a given class is maintained by promoting only those in the class or classes below it who have earned their promotion by having reached the average standard of that class. It is usual in good secondary boys' schools to have special masters for each of the subjects, French, German, science, and frequently

also mathematics, while all the other subjects are taught by the 'class' master. In the girls' schools recently established under the Girls' Public Day School Company, and other proprietary bodies, the 'departmental' system of staffing, in its fullest development, where every subject is taught by a specialist, has found great favour. This is largely due to the fact that in these girls' schools so many of the subjects of the curriculum are elective, and not compulsory. The mode of classification known as 'bifurcation'—where at a given stage in his school career, say, on arriving at the fourth form, a boy has the choice of continuing a purely classical course on the classical 'side,' or combining less classics with more modern languages or science or mathematics on the 'modern' or 'science' side—finds favour principally in the great public schools, and in some other first-grade schools. This plan is open to the objection 'that it seems often difficult to prevent these modern departments from being a refuge for boys whose inferior ability has prevented their success in classical studies, and a special department flooded with the idle and the dull cannot well be otherwise than a failure' (*School Inquiry Commissioners' Report*, vol. i. p. 17). But this danger has been obviated in many of the best schools which adopt bifurcation, by treating both 'sides' as of equal dignity, distributing the rewards of the school impartially between the two, staffing the two 'sides' with masters of equally high attainments, and strenuously demanding from both master and boys an equally high standard of meritorious work.

Class Rooms. *See* ARCHITECTURE OF SCHOOLS.

Clerical Schoolmasters are of two classes. In many of the rural parishes, where the endowment of the school is small, the only way of obtaining a graduate master, where such is necessary by the original deed, is to appoint to the mastership the incumbent or his curate. There are a few cases in which this course appears, in the present disjointed state of secondary education, to have in some degree raised the character of the school. Indeed, in some of the northern counties the combination of the offices of parish clergyman and schoolmaster is frequent and useful. The combination, however, has been objected to on the ground that a man with only half his heart in his work and only half his time given to it is not so useful to a school as one who, with nominally inferior qualifications, has studied the art of teaching, is in sympathy with his pupils, and devotes his whole energies to his work. 'Some of the worst schools,' said Mr. Fitch in his Report to the School Inquiry Commission, 1867–68, 'which I ever saw in my life were conducted by clergymen.' The Court of Chancery has in various cases ordered that the master should be a clergyman when the founder of the school has not so ordered. Dean Colet, the founder of St. Paul's, ordered by his statutes that neither of the masters of that school, if in orders, nor the chaplain, shall have any benefice with cure or services which may hinder the business of the school. There is no rule of law which prevents a master of a school from holding an ecclesiastical preferment. If, of course, the holding of the two offices should cause him to neglect the duties of either, the remedy is the same as if he neglected either of his offices for any other cause. The second class of clerical schoolmasters consists of those who have taken holy orders with the view mainly of making teaching a profession. It is at times advantageous for a schoolmaster to be in orders, because some parents are not satisfied that the morals of their boys are well looked after unless the schoolmaster is a clergyman. His taking to schoolmastering does not, however, militate against his chances of promotion in the Church; indeed in many cases it is favourable to such promotion. Many of our bishops and other of our dignified clerics have been schoolmasters.

Closing Schools for Epidemic Diseases is but seldom required, though more often in boarding than day schools. In the former the necessity can usually be obviated by early isolation of suspected cases (all doubtful cases of illness should be treated as though it were certain that they were infectious), and by the establishment of a properly organised school infirmary or sanatorium (*q.v.*). The closing of day schools under the following circumstances may be advisable: (1) If the attendance at school is greatly reduced by a severe epidemic (as of Measles, for instance), preventing the continuance of a regular course of study. (2) In thinly populated rural districts, where children seldom meet except in school, closing the

school may effectually check the spread of an epidemic; but in towns and large villages it is of little use, as the children play together out of school hours. (3) If any local sanitary defects of the school are detected, the school should be closed during their repair. Children are apt to crowd round open drains, to watch the workmen, and in this way sore throat, or even diphtheria or typhoid fever, may be produced. It should be remembered that the local sanitary authority of the district, on the advice of their medical officer, have power to order the closing of any public elementary day school, and the managers of the school forfeit the grant from the Education Department on failing to carry out the wishes of the sanitary authority. This is subject to appeal to the Education Department. (1) If more careful attention were paid to the early symptoms of infectious diseases (*q.v.*), and all children suffering from suspicious symptoms were sent home until uncertainty was removed, it would seldom be necessary to close schools on account of a prevalent epidemic. Attention to the following additional rules would also tend to obviate the same necessity: (2) No child should be allowed to return to school until a reasonable time has elapsed (*see* DURATION OF INFECTION) from the beginning of the disease, nor without a medical certificate of freedom from infection. (3) No other child from the infectious house should be allowed to attend school, although apparently well. (4) All parents should be obliged (under penalty of a fine) to report all cases of infectious disease to the sanitary authority. (5) Where the last regulation is not in force, teachers or the school visitor should intimate to the inspector of the sanitary authority the absence of all children whose cases are suspicious. Teachers not infrequently send scholars to enquire about absentees, and thus they are brought in contact with infection.

Coach.—Name given to tutors who devote themselves to the preparation of students in special subjects. The services of a 'coach' are especially in request, and are proportionately valued, by candidates for the various examinations for university honours and appointments under Government. The 'coach,' being a specialist in the subjects for which he prepares candidates, is enabled to direct his pupil's attention to the technical and particular points which are likely to arise in any special examination.

Cocker, Edward (*b.* 1631).—An engraver and teacher of writing and arithmetic, famous for a school-book with which his name has been familiarly associated in the phrase 'according to Cocker.' *Cocker's Arithmetic*, 1677, published after the author's death, reached the 37th edition in 1720. He is also the reputed author of fourteen books of exercises on penmanship, of which one is extant in the British Museum.

Code.—The term 'code,' in its strict sense, is the short title for the 'Code of Regulations by the Lords of the Committee of the Privy Council on Education' (*q.v.*), laid annually on the table of both Houses of Parliament, pursuant to the 97th section of the Elementary Education Act, 1870. When it has been upon the table for one month (during which it may be modified by Parliament), it becomes law—a schedule, in fact, of the Elementary Education Acts of 1870, 1873, 1874, 1876, 1879, 1880, which together constitute the Elementary Education law in force for the time being. There are separate Committees of the Privy Council on Education for England and Wales and for Scotland, and separate 'codes.' These Codes contain the conditions required to be fulfilled by public elementary schools, and by training colleges for teachers, in order to obtain an annual Parliamentary grant in aid of maintenance. The Codes for the two countries are (1888) very similar in the character and scope of their regulations, the three main points of difference being (1) that in the Scotch Code the definition of the class of school which may receive Parliamentary grants is more elastic than that in the English Code, in the direction of allowing higher fees to be charged and greater latitude for the teaching of more advanced subjects; (2) that in the former Code a training college is defined as a 'college for the instruction of candidates for the office of teacher,' and may therefore be either a 'resident' or 'non-resident' college; while in the latter Code it is defined as an 'institution for boarding, lodging, and instructing' such candidates, thereby excluding non-resident colleges, but the Code for 1889, if sanctioned by Parliament, will permit both kinds of training colleges to be recognised in England; (3) graduates in arts or science of any university in the United

Kingdom are recognised as teachers under certain conditions as to practical skill. Accordingly it will be sufficient in the present article to speak of the English Code only.

The following is a brief analysis of the Code: 1. A public elementary school is a school at which elementary education is the principal part of the education there given, and at which the fees do not exceed 9*d.* a week per scholar. It must be conducted subject to a *conscience clause* (*q.v.*), giving the right of exemption of any scholar from attendance at any religious worship, observance, or instruction. Religious instruction, if given, must take place at either the beginning or end, or at the beginning *and* end, of each school meeting. 2. The annual grants are made, to the managers of this school, after a report from one of her Majesty's inspectors of schools upon the condition of the school as to general efficiency, and as to premises, apparatus, staff organisation, discipline, and the amount and quality of the instruction. No grant is made for any instruction in religious subjects. 3. Any persons are eligible as managers of an elementary school. School boards are the managers of all schools provided by them. Managers may not derive any emolument from their schools, and the school must not be conducted for private profit. The principal teacher must be *certificated* (*see* TRAINING OF TEACHERS). 4. The school must have met not less than 400 times (each attendance being for not less than two hours of secular instruction) during the school year. 5. The annual grant is made up of several grants: (*a*) In infants' schools (ages three to seven), a *fixed* grant of 9*s.* (or 7*s.*) for each unit in the average attendance for the year; a *merit* grant of 2*s.*, 4*s.*, or 6*s.*, if the inspector reports the school to be fair, good, or excellent; a needlework grant of 1*s.*, and a singing grant of 1*s.* (or 6*d.*). (*b*) In boys' and girls' schools (ages seven and upwards) a *fixed* grant of 4*s.* 6*d.*; a *merit* grant of 1*s.*, 2*s.*, or 3*s.*; an *examination* grant in 'elementary' subjects, determined by the inspector's reports on the percentage of passes of *individual* scholars in the standards, at the rate of 1*d.* for each unit of percentage, but the Code for 1889 proposes to substitute for these three grants just named a '*general* grant' of 12*s.*, or 14*s.*, or 15*s.* 6*d.*, and this grant may be reduced to 12*s.* or wholly withdrawn on the ground of inefficiency; but this latter penalty will not be inflicted until after a year's warning. The other grants are a *needlework* grant of 1*s.* (girls); a *singing* grant of 1*s.* (or 6*d.*); an *examination* grant in 'class' subjects of 1*s.* or 2*s.* for each of two subjects; an *examination* grant in (at most) two 'specific' subjects of 4*s.* per each scholar passing in each subject (confined to Standards V., VI., and VII.). The 'class' subjects are English, including repetition and grammar, geography, elementary science, history, needlework (for girls). The 'specific' subjects are algebra, Euclid and mensuration, mechanics, Latin, French, animal physiology, botany, principles of agriculture, chemistry, physics, domestic economy and cookery (girls). All except the last-named grant are calculated upon the 'average attendance' for the year. The elementary subjects are reading, writing, and arithmetic. These, and needlework for girls, are obligatory (*see* COURSE OF INSTRUCTION and STANDARDS). 6. Grants are also made to evening schools under specified conditions as to attendance and efficiency, as tested by inspection. No scholar in any evening school may be presented for examination in class or specific subjects alone who has not passed in the fifth standard in the elementary subjects. 7. The Code also contains schedules which lay down the seven standards of examination in elementary subjects, and the course of instruction in class subjects, in needlework, and in specific subjects; also the qualifications and certificates required of pupil teachers (*q.v.*). 8. The teachers recognised by the Department in day schools are: (*a*) pupil teachers not less than fourteen years of age; (*b*) women over eighteen years of age, approved by the inspector when employed in mixed, girls,' or infants' schools, reckoned as equivalent to a pupil teacher; (*c*) assistant teachers who have passed the examination for admission to a training college; (*d*) provisionally certificated teachers who have passed in the first or second class in the examination for admission to a training college, and who, if specially recommended by the inspector on the ground of their practical skill as teachers, are recognised as eligible for head teachers in small schools, up to twenty-six years of

age; (*e*) certificated teachers. Lay persons only are recognised. The power of appointment and dismissal of teachers rests solely with the managers. The number of pupil-teachers must not exceed three for the principal teacher and one for each certificated assistant teacher. 9. Teachers can obtain certificates only by examination and probation by actual service in school. There are two examinations, corresponding to the first and second years of residence in training colleges, and they are open to (*a*) students who have resided for at least one year in training colleges under inspection; (*b*) candidates who, being upwards of twenty years of age, have been employed for not less than two years as provisionally certificated teachers, or (*c*) have served as assistant teachers for at least twelve months in inspected schools under certificated teachers. After passing these two examinations, candidates for certificates must, as teachers continuously engaged in the same schools, obtain two favourable reports from an inspector, with an interval of at least one year between them. Certificated teachers will not henceforth (1889) be necessarily thereby qualified, as heretofore, to have the superintendence of pupil teachers; but only if in the examination for the second year they have been placed in the first or second division of the class list, and the right to superintend pupil-teachers may be suspended or withdrawn if the Education Department, on the report of the inspector, consider that a teacher has neglected his duty in this respect. (*See* TRAINING OF TEACHERS.)

10. The certificates have hitherto been of three classes. A successful examination in the subjects for second year's students (in training colleges) entitled to a second-class certificate; in the subjects for first year's students to a third class certificate. A third-class certificate could be raised to a second-class by re-examination, but a second-class could only be raised to a first-class by (ten years') good service only. Henceforth there is only to be one class of certificate. Teachers now holding certificates of the third-class, and candidates henceforth placed in the third division of the examination in the subjects for the second year, may acquire the right to superintend pupil-teachers by passing an examination in the papers for the second year, and obtaining a place in the first or second division. Teachers can be examined for this purpose only once in two years. A certificate may at any time be recalled or suspended, but not until the Department has informed the teacher of the charges against him, and given him an opportunity of explanation. Any person over eighteen years of age (not necessarily a layman) approved by the inspector may be recognised as a teacher in an evening school. 11. The Code also contains clauses for the limitation and reduction of the grant under certain circumstances. The total annual grant, exclusive of some special grants, is limited by the Education Act of 1876 to the greater of the two sums named, viz., (*a*) a sum equal to 17*s.* 6*d.* for each unit of average attendance; (*b*) the total income of the school from all sources whatever other than the grant, and from some special grants. The annual grant may be reduced upon the inspector's report, for various faults of organisation, discipline, instruction, or registration; and for defective accommodation, apparatus, and insufficient teaching staff.

Colet, John (1466–1519), Dean of St. Paul's, and founder in 1509 of the school now known as 'St. Paul's School,' was one of the most striking personages of a most interesting period—that, namely, when the first stirrings of the movement which led to the Reformation in England began to make themselves felt. He was learned, clear-sighted, and outspoken—with touches at times of an almost fiery indignation when confronted by any ignorant, self-seeking, or slothful impiety—pure-hearted, noble-minded. The most notable thing about his school was its being the first in England in which Greek was taught; while Lilly, its first head-master (or rather 'high master'), was the author of, amongst other things, the famous *Propria quæ maribus* and *As in præsenti*. An excellent short account of *Colet's Life and Work*, by Mr. J. H. Lupton, has lately been published (G. Bell & Sons). As an example of Colet's clear-sightedness in matters of education, it may be mentioned that his statutes specially make provision for future changes and developments. In his Accidence, which he specially prepared for the boys of his school, he says, 'In the beginning men spake not Latin because such rules were made, but contrari-

wise, because men spake such Latin, upon that followed the rules. That is to say, Latin speech was before the rules, and not the rules before Latin speech.'

College (Lat. *collegium*) originally denoted a collection or society of persons, invested with certain rights and powers, and performing certain duties, or occupied in the same employment. In a particular sense 'college' signifies an assembly for a political or ecclesiastical purpose, as at Rome the *collegium pontificum*. In Great Britain and America some societies of physicians are called 'colleges,' as, for example, the Royal College of Physicians, incorporated by the State. The term implies institutions affiliated to a recognised university which are endowed with revenues, their fellows, tutors, and students living together under a head in a particular building. The academic use of the word college began about the fifteenth century, the first being established at Paris. The word is now generally used to signify almost all educational institutions of recognised repute, and has in recent years been largely adopted by the proprietors of private schools. From the title of Gray's ode, *On a Distant Prospect of Eton College*, it is evident that the term was long ago applied to that famous public school. (*See* UNIVERSITIES and PROVINCIAL COLLEGES.)

Combe, Andrew, *b.* Edinburgh 1797, and took his M.D. at that university. Before reaching his twentieth year he became an advocate of phrenology, and, in conjunction with his elder brother, George, established the *Edinburgh Phrenological Journal*. He visited Spurzheim, who strongly confirmed him in his phrenological views. George Combe was an ardent advocate of popular education and social progress, and Andrew seems to have imbibed from him that profound interest in the physical and mental well-being of his countrymen which so eminently characterised him. However strongly we may question the phrenological views of the brothers, their claim to fame and gratitude rests chiefly on other grounds. In 1834 Andrew Combe brought out the first edition of his *Principles of Physiology, applied to the Preservation of Health and to the Development of Physical and Mental Education*. This book still maintains its supremacy as a popular guide to physiology as applied to the preservation of health. It is a popular manual, interesting to all, without deviating from the sobriety and accuracy which should mark a manual on a scientific subject. Its popularity was at once great, and its sale has been enormous both in this country and in the United States. In the first edition Dr. Combe urged that physiology should form a part of general education. This was received with ridicule or doubt, or even with disgust. Since that time, however, the wisdom of the proposition has been almost universally acknowledged, though its practical adoption is still imperfect and partial. The science of physiology is one of the optional subjects under the Elementary Education Code, and the introduction of hygiene (i.e. the laws of physiology as applied to health) as a new science in the list of the subjects of the Science and Art Department is another notable step. In 1838 Dr. Combe was appointed one of the physicians extraordinary to the Queen in Scotland, and about the same time he published his popular *Manual on Disorders of Digestion*, which rapidly passed through nine editions. His last work, in 1840, was entitled *A Treatise on the Physiological and Moral Management of Infancy*, which is full of interesting and practically important matter. He died in 1847.

Comenius, Johann Amos (*b.* Nivnitz, Moravia, 1591, *d.* 1671), one of the most illustrious educational reformers, was the son of a miller who was a member of the Moravian Brethren, of which religious body Comenius became a bishop. His parents died while he was a child, and he was left to the care of guardians. At school he learnt 'reading, writing, the catechism, and the smallest beginnings of arithmetic.' He was sixteen before he began the study of Latin. His account of schools is unfortunately still far too true where he says, 'they are the terror of boys and the slaughterhouses of minds—places where a hatred of literature and books is contracted.' But he gave a life of untiring zeal to develop a system of education that should at least have some resemblance to the meaning of the word. He took up the work which had been commenced by Ratich (*q.v.*), and began by simplifying the Latin grammar. He was ordained to the pastorate in 1616, and in 1618 was appointed to one of the largest churches of the Moravians at Fulnek. Here he had charge of a school

as well, and here too he married. But in 1621 Fulnek was taken by the Spaniards, and Comenius lost everything, including his library and manuscripts. In 1622 he lost his wife and only child, and for some years, owing to the destruction and persecution of the Thirty Years' War, he was a wanderer. It was whilst witnessing much of the misery and distress of this calamitous period that he devised a plan for the renovation of schools as a means to restore religion.

The Baconian philosophy was the educational inspiration of Comenius, whose career is a lucid exposition of the proposition that all progress in science has its corresponding effects on education. When an innovator has modified the laws for the discovery of truth, other innovators appear who modify, in their turn, the rules for instruction. A new dialectic almost necessarily brings about an analogue to itself in a new pedagogy. In 1605 the first publication took place of Lord Bacon's celebrated treatise *Of the Proficience and Advancement of Learning*, which was destined to place educational methods on a scientific foundation. This was followed in 1620 by the *Novum Organum*. For some time the thoughts of men had been turning to the study of nature; and Bacon, as the personification of this tendency, had the royal happiness of opening up unknown routes to learned investigation. For he gave to the movement the necessary impulse by his masterly survey of the domain of human knowledge, by his frequent suggestions, and his formulation of scientific method. It has been said that Bacon was not aware of his relations to the science and art of education, on the ground that he praises the Jesuit schools, not knowing or not regarding the circumstance that he was, by his philosophy, subverting their very foundations. The sum of Bacon's doctrine was that we know inductively; and the mechanism of deductive reasoning was to be replaced by the slow and patient interpretation of facts and phenomena. It was necessary to open the eyes to the contemplation of the universe, and by sense-intuition, by observation, by experiment, and by induction, to penetrate its secret and determine its laws. It was necessary to ascend step by step, from the knowledge of the simplest things to the discovery of the most general laws, and finally to demand of nature herself to reveal all that the human intelligence, in its solitary meditations, is powerless to discover or to evoke. The reversal of the antecedent scientific method contained within itself a revolution of the science of education, to effect which all that was needed was to apply to the development of the intelligence and to the communication of knowledge the rules proposed by Bacon for the investigation of truth. The laws of scientific induction might become the laws for the education of the soul; and it was the conversion or the translation of the maxims of the Baconian logic into the capital principles of education that constituted the great mission of Comenius. Bacon, though not himself a realist in the modern and abused sense of that term, was the father of realism. It was this side of his teaching which was greedily seized upon, and even exaggerated. Educational zeal now ran in this channel. The new enthusiasts, in their dream that they could make men to order, failed to see that the genius of the Reformation is the genius of freedom, and that man refuses to be manufactured except on suicidal terms. He must first sacrifice that which is his distinctive title to manhood—his personality. The prophets of educational realism have always failed, as they fail now, to understand man and his education, because they break with the past, which is to them, as it was to the Baconian realists, merely a record of blunders. The modern humanist more wisely accepts the past as the storehouse and the register of the thought and the life of human reason. In the life of man each individual of the race finds his own true life. This is modern humanism—the realism of thought.

The ideas of Comenius were accepted by the most advanced thinkers of the age, notably by Milton, and by Oxenstiern, the Chancellor of Sweden. His schoolbooks were circulated throughout Europe. He wrote a large number of works in Latin, in German, and in Czech. The three which are most noticeable in this connection, and in which he has set forth the general and characteristic principles of his method, with statements and illustrations of their application, are the *Didactica Magna*, the *Great Didactics*, written in Czech about 1630, and rewritten in Latin some ten years after-

wards; the *Janua Linguarum Reserata*, the *Gate of Languages Unlocked*, 1631, which was translated into twelve European and several Asiatic languages, notably into the Arabic, Persian, and Turkish; and the *Orbis Sensualium Pictus*, the *Illustrated World of Sensible Objects*, 1658; the most popular of all the works of Comenius being, in fact, the *Janua Linguarum*, accompanied with pictures in lieu of real objects, representing to the child the things that he hears spoken of as fast as he learns their names. The *Orbis Pictus*, the first practical application of sense-realism, had an extraordinary success, and has served as a model for the innumerable illustrated books which for more than two centuries have ministered to the instruction of the schools.

Comenius is a repertory of new and judicious ideas; and several of the methods of instruction which we should be tempted to consider as of purely recent initiation had already been suggested to his imagination. But what is of more consequence with Comenius than a few happy discoveries in practical instruction, is the general inspiration of his work. He gives to education a psychological basis in demanding that the faculties shall be developed in their natural order: first, the senses, then, successively, the memory and the imagination, and finally the judgment and the reason. He is mindful of physical exercises and of technical and practical instruction, without forgetting that in the primary schools, which he calls 'studios of humanity,' there must be trained not only strong and skilful artisans, but virtuous and religious men, imbued with the principles of order and justice. He does not allow himself to be absorbed in the minute details of school management. He has higher views; he is working for the regeneration of humanity. The system sketched by Comenius 'will be found,' to use the words of Mr. Oscar Browning, 'to foreshadow the education of the future.'

He was repelled and disgusted by the long delays and pedantries of the schools. His ardent mind conceived that if teachers would but follow nature instead of forcing it against its bent, take full advantage of the innate desire for activity and growth, all men might be able to learn all things. Languages should be taught as the mother tongue is taught, by conversations on ordinary topics; pictures, object-lessons, should be freely used; teaching should go hand in hand with a cheerful, elegant, and happy life. Comenius included in his course the teaching of the mother tongue, singing, economy, and politics, the history of the world, physical geography, and a knowledge of arts and handicrafts. But the principle on which he most insisted, which forms the special point of his teaching, and in which he is followed by Milton, is that the teaching of words and things must go together hand in hand. When we consider how much time is spent over new languages, what waste of energy is lavished on mere preparation, how it takes so long to lay a foundation that there is no time to rear a building upon it, we must conclude that it is in the acceptance and development of this principle that the improvement of education will in the future consist. Any one who attempts to inculcate this great reform will find that its first principles are contained in the writings of Comenius. But this is not the whole of his claim upon our gratitude. He was one of the first advocates of the teaching of science in schools. His kindness, gentleness, and sympathy make him the forerunner of Pestalozzi; his general principles of education would not sound strange in the treatise of Herbert Spencer. But it is also to be recorded with all possible emphasis that, in the process of adapting his conception of universal education to the social conditions of his time, Comenius was led to the institution of a gradation of schools that underlies all modern systems of public instruction. Nothing could be more exact or more clearly defined than the scholastic organisation which he elaborated; and the distribution which it involved, of schools into the four several and successive grades of (1) the infant, or maternal, school; (2) the primary or elementary public school, otherwise called the common or vernacular school, or, again, the people's school; (3) the secondary or Latin school, the gymnasium; and (4) the higher school, the equivalent of the college, academy, or university. The experience of nearly three centuries has sanctioned and established the school classification of Comenius, whose intention it was that in the intermediate schools the instruction should be so balanced and so symmetri-

cally administered that any pupil on leaving them might carry away with him such a general education as befitted his fortunes or his future destination. 'We pursue,' says Comenius, 'a general education, the teaching to all men of all the subjects of human concern.' And again, 'the purpose of the people's school shall be that all children of both sexes, from the tenth to the twelfth or the thirteenth year, may be instructed in that knowledge which is useful during the whole of life.' It was the ordinance of Comenius that 'there should be a maternal school in each family, an elementary school in each district, a gymnasium in each city, an academy in each kingdom, or even in each considerable province.' (*See* also REFORMATION.)

Commercial Education. *See* TECHNICAL EDUCATION.

Companionship. — Locke says that company is a greater force to work upon the pupil than all that can be done by the educator. The educative value of companions is strikingly illustrated in the difficulties that present themselves to the parent in the early home training of a solitary child. The influence of companions is seen first in promoting intellectual development. A child's mind is stimulated to observe and to think by the movements of others' minds. Play, by its action of mind on mind and its association of a number of individuals in concerted orderly action, illustrates the stimulating effect of companionship on the intelligence and active powers On the moral side the benefits are still more manifest. The individual can only realise his moral nature by means of social relations, and these are first experienced by the child in intercourse with other children. Companionship works powerfully through the impulse of imitation. This is illustrated in the effect of a single companion in modifying the taste, inclination, and thoughts of a child; and it is seen still more plainly in the influence of numbers in assimilating the opinions, sentiments, and rules of action of a boy to those of the set or community of which he is a member. The influence of companions on this larger scale is a prominent feature of school life, serving to differentiate it from the life of the home, and requiring to be specially taken into account in a comparison of the advantages of home and school training. The 'sympathy of numbers,' as it is called, is a force which the teacher has to reckon with in all class work. The learner is as much, at least, subject to the prevailing feeling of the class as he is to the personal influence of the teacher; consequently, where the former is hostile to the latter, discipline becomes impossible. On the other hand, the presence in a class of a cheerful alertness, of a spirit of industry, and of a feeling of respect for authority, is the most valuable auxiliary which the preceptor can secure. The freer and more varied action of companionship is seen in the playground, where it may shew itself, as *Tom Brown's School Days* and other stories of school life well illustrate, as a moral influence of a singularly deep and lasting kind. Such being the importance of companionship, the educator should make it one chief part of his business to select, more particularly in the early years before the child's character is formed, pure and right-minded companions. And the thoughtful schoolmaster will seek in every way to enlist the influence of numbers on his side by judiciously acting upon, instructing, and correcting the prevailing beliefs and sentiments of his community. (*See* article 'Umgang' in Schmidt's *Encyclopädie*.)

Competitive Examinations. *See* EXAMINATION.

Composition. *See* ESSAYS.

Comte, Isidore Auguste Marie François Xavier (*b.* 1798, *d.* 1857), the Positive philosopher, was educated at the École Polytechnique, and at first embraced the socialist tenets of St. Simon. He subsequently abandoned these for the philosophy now associated with his name. The scheme of education which he therein expounded is as striking as it is original and peculiar. He was dissatisfied with the then prevailing systems. No education, he considered, would be satisfactory unless it inculcated a thorough knowledge of each science. Let us, he cried, have a new class of students, suitably prepared, whose business it should be to take the respective sciences as they are, determine the spirit of each, ascertain their relations and mutual connection, and reduce their respective principles to the smallest number of general principles in accordance with the fundamental rules of the Positive method (*see* his *Philosophie Positive*). At the same time let other students be prepared for

their special pursuit by an education which recognises the whole scope of the Positive science, so as to profit by the labours of the students of generalities, and so as to correct reciprocally, under that guidance, the results obtained by each. Such a reform would strengthen the intellectual functions, regenerate education, advance the sciences by combining them, and reorganise society. Hence, Comte contended, the only logical, as well as the only historical, way of educating youth effectually was to teach them the sciences according to the order promulgated in his hierarchy of the sciences—mathematics, astronomy, physics, chemistry, biology, and sociology On such principles an education would have a powerful gymnastic effect upon the mind. A good education would include knowledge of the general principles at least of each of these; and as each science trains to a special way of thinking, the perfectly trained mind was that which had been exercised in all these sciences. No student could know a science without a competent knowledge of the anterior sciences on which it depended. Physical philosophers could not understand physics without at least a general knowledge of astronomy; nor chemists chemistry without physics and astronomy; nor, above all, the student of social philosophy sociology without a general knowledge of all the anterior sciences. As such conditions were never at the present day fulfilled there could be no rational scientific education. Hence the imperfection of even the most important scientific education. If the fact was so in regard to scientific education, it was no less strikingly so in regard to general education. Our intellectual system could not be renovated until the sciences were studied in their proper order. Even the highest understandings were apt to associate their ideas according to the order in which their ideas had been received, and it was only an intellect here and there, in any age, which in its utmost vigour could, like Bacon, Descartes, and Leibnitz, make a clearance in the field of knowledge so as to reconstruct from the foundation their system of ideas.

Conception.—This term, as the etymology suggests (*con* and *capio*, to take together), describes the act by which we gather up in a single mental representation a number of like objects which are thereby constituted into a class, as animal, metal. This is effected by comparing concrete individuals one with another, and seizing the quality or qualities which they possess in common. The result of the act of conception, which is necessarily embodied in a general name, is known as a concept. The essential process in conception is abstraction. This correct meaning of conception (viz. the symbolic representation of a *general class*) must be carefully distinguished from another meaning often attached to the word in educational writings, viz. the mental realisation of some *concrete object* or incident, e.g. the Temple at Jerusalem, through the medium of verbal description. This last operation is best described as an act of constructive imagination.

Conceptualism. *See* SCHOLASTICISM.

Conduct *See* CHARACTER.

Congregation (Oxford) has been greatly confused in its meaning by an Act of Parliament in 1854. Before then the business of the University was transacted by two distinct assemblies, the Houses of Congregation and of Convocation. The ancient House of Congregation, which consists of all the persons who in ancient times were specially charged with the education and discipline of the University, has now nothing to do with legislation, and its business is confined almost exclusively to the granting of degrees. The Act of 1854 created the 'Congregation of the University of Oxford.' It consists of the Chancellor of the University and several other officials, together with 'all those members of Convocation who reside within one mile and a half of Carfax for twenty weeks during the year ending the 1st of September.' The business of this new congregation is chiefly legislative. When the Hebdomadal Council has framed any new statute, it must first be promulgated, after due notice, here, and then, after three entire days, it is to be proposed here for acceptance or rejection. A statute approved by Congregation is to be submitted to Convocation, after an interval of seven entire days, for final adoption or rejection. At Cambridge the meetings of the Senate in the Senate House are styled Congregations. They are held for the purpose of legislation, examination, or the conferring of degrees. The members of the Senate are the chancellor, vice-chancellor, doctors of the various faculties, masters of arts, law, and surgery, and bachelors of di-

vinity, whose names are on the University register. (*See* UNIVERSITIES.)

Conscience Clause.—The controversy associated with this term has arisen from the efforts which have been made from time to time by Parliament to reconcile Dissenters from the Established Church to state-aid for the schools of that Church out of the general taxation of the country, and to induce them to accept elementary education for their children in schools which, by the terms of their trust-deeds, were bound to give religious instruction in accordance with the doctrines and tenets of the Church of England.

For the six years (1833–1839) after the first Parliamentary grant was made in aid of elementary education the Government in no way interfered with the constitution of the Church schools aided by grants. But after the appointment of the Committee of Council on Education in 1839, the Committee published specimens of 'management clauses' for insertion in the trust-deeds of Church schools aided by building grants. These clauses were at first only suggested for adoption; but, in 1847, their insertion (in one or other of the 'specimen' forms) was required of all schools which received building grants, whether founded under the auspices of the National Society, or any Church of England trust, or that of any other denomination.

These management clauses tried to protect the local conscience in the matter of religious instruction by securing that the committee of management should consist in part of representatives of the lay subscribers to the school. But the first appearance of a clause explicitly providing that the consciences of Nonconformists should be protected from enforced teaching of the catechism and attendance at church for their children, dates from 1843—four years earlier—when Sir James Graham introduced into his Factory Bill of that year provisions for the compulsory education of children in factories by means of factory schools, to be maintained out of the poor-rate. This Bill recognised the liberty of parents to send their children to any Sunday school, and provided that instruction in the catechism and Church doctrines should be given at a separate hour and in a separate room, and that religious instruction might also be given separately by Dissenting ministers when it was desired.

This ill-fated Bill was, however, strenuously opposed both by Churchmen and Dissenters, and never became law.

The controversy thus temporarily lulled broke out afresh in the year 1862. The grievances of Nonconformists living in small parishes only capable of maintaining *one* school, which was, of course, a Church school, made themselves heard in unmistakeable language before the Duke of Newcastle's Commission, 1858–1861. But the Commissioners themselves in their report declined to recommend a compulsory conscience clause, which they thought would give a dangerous shock to the existing system. The Committee of Council, however, in framing the minutes of 1862, were anxious that a conscience clause should be introduced into such schools, so as to relieve the children of Nonconformists from the obligation of learning the Church catechism, and of receiving instruction in the doctrines of the Church of England. The Committee, accordingly, proposed to the National Society (with which most of the Church of England schools are in connection) a new management clause, which provided that, in a parish where only one school could or ought to be maintained, the children of parents not in communion with the Church or denomination with which the school was connected, might be admitted to the secular instruction of the school without injury to the consciences of their parents. The new clause was then to be inserted in every trust-deed which the Committee of Council had to approve for a school about to be built by aid of the Parliamentary grant in districts *where there was no room for a second school.*

The exact wording of the clause is important, and stood as follows: The Management Committee of the schools accepting the clause 'shall be bound to make such orders as shall provide for admitting to the benefits of the schools the children of parents not in communion with the Church of England, but such orders shall be confined to the exemption of such children, if their parents desire it, from attendance at public worship, and from instruction in the doctrines and formularies of the said Church, and shall not otherwise interfere with the religious teaching of the said scholars, and shall not authorise any other religious instruction to be given in the school.'

The National Society, however, replied that they felt unable to accede to the request made to them by the Committee of Council. The dispute was destined to remain unsettled until the appearance of the Education Bill in 1870. This famous Bill defines a 'public elementary school,' which alone would henceforth be entitled to a share of the Parliamentary grant, as one wherein, *inter alia*, '(1) it shall not be required, as a condition of any child being admitted into or continuing in the school, that he shall attend or abstain from attending any Sunday school or any place of religious worship, or that he shall attend any religious observance, or any instruction in religious subjects, in his school or elsewhere, from which observance or instruction he may be withdrawn by his parent, or that he shall, if withdrawn by his parent, attend the school on any day exclusively set apart for religious observance by the religious body to which his parent belongs; (2) The time or times during which any religious observance is practised, or instruction in religious subjects is given at any meeting of the school, shall be either at the beginning or at the end, or at the beginning and the end of such meeting, and shall be inserted in a time-table to be approved by the Education Department, and to be kept permanently and conspicuously affixed in each schoolroom; and any scholar may be withdrawn by his parent from such observance or instruction without forfeiting any of the other benefits of the school.' This last sub-section of section 7 of the Education Act of 1870 is colloquially known as 'the time-table conscience clause.' Very little opposition was raised to this section of the Act from the old opponents of a conscience clause; the strife was much fiercer around another part of the same question, as to what should be the nature of the protection afforded to the conscience in schools to be erected and maintained by School Boards out of funds derived from the rates. Mr. Forster proposed originally that School Boards should be left perfectly free to decide upon the kind of religious instruction which should be given in their schools. Eventually, however, the Government adopted, and Parliament accepted, a clause familiarly known as the Cowper-Temple clause, after the name of its promoter, which enacted (Act 1870, sec. 14) that every school provided by a School Board, besides being a 'public elementary school' within the meaning of the Act, and as such subject to the conscience clause provisions cited above (sec. 7 of the Act), should be one 'in which no religious catechism or religious formulary which is distinctive of any religious denomination shall be taught.'

It is a matter of contemporary contention whether the conscience clause as it now stands offers an adequate protection to the religious liberty of nonconformist parents. It is said that there is an unwillingness on the part of poor parents, especially in rural parishes, to take advantage of the provisions of the Act, for fear that, if they did, they would incur the displeasure of powerful people in their neighbourhood, upon whom they are more or less dependent; and that the children themselves, with a perfectly natural sensitiveness, dislike to be pointed out as singular or exceptional, and so shrink from claiming the protection accorded to them by the law.

Consequences (Discipline of).—This phrase refers to the proposal of Rousseau, revived and developed by Mr. Herbert Spencer, that children's wrong-doing, instead of being visited by punishment (in its commonly understood sense), should be left to be corrected by an experience of its natural consequences. These would include not only the proper physical result of careless, imprudent actions—e.g. playing with fire, leaving toys or books in disorder—but also the natural social consequences, such as the loss of friendship, trust, &c. The full and consistent carrying out of this idea would clearly be impossible. The child's ignorance of the effects of its action renders a number of prohibitions necessary for its physical maintenance and well-being. Not only so, it may be reasonably maintained that these so-called natural penalties could never take the place of punishment proper—that is, inflictions attached by an authority to disobedience to its commands—as a means of moral development. It may, however, be readily conceded that in many cases a child is best left to the discipline of consequences, e.g. by being allowed to indulge within certain limits its greedy propensities. And where the educator has to impose prohibitions, the principle of natural consequences may be made use of by selecting such forms of punishment as will be seen by the

culprit to be naturally connected with the wrong-doing. (*See* Rousseau's *Emile*, book ii.; Herbert Spencer's *Education*, chap. iii.; Bain's *Education as a Science*, chap. iii.; Buisson's *Dictionnaire de Pédagogie*, art. 'Obeissance.')

Constructive Faculty.—By this term is meant the mind's power of combining the elements supplied by its experience in new forms. The process of construction is thus not, strictly speaking, one of mental origination, but merely of recasting and rearranging materials derived from the impressions of the past. It implies the retention and the reproduction of these impressions according to the Laws of Association. Beyond this it involves the action of the will in controlling the succession of ideas due to the play of association, the due selection of what is fitted, and the rejection of what is unfitted to take a place in the desired product. The term refers in common discourse to all forms of practical contrivance and device, whether subserving the end of beauty or of utility. Thus, we speak of the constructive power of an architect, a mechanical inventor, and so forth. These practical operations, however, are only particular manifestations of a power which is exercised much more widely. Throughout the acquisition of knowledge by the processes of verbal instruction, as well as in the independent discovery of new facts and truths, the combining of old materials into new forms is illustrated. The child has to construct a new mental picture every time he realises a description of an unknown place, object, or event. The training of the constructive faculty thus enters into all intellectual education, the cultivation of the imagination by the Fine Arts (*see* IMAGINATION), and, lastly, into all practical exercises, such as those of the voice in learning to speak and to sing, of the hands in kindergarten employments, drawing, writing, &c., gymnastic movements, and so forth. (*See* Bain, *Mental and Moral Science*, bk. i. chap. iv.)

Consortium Magistrorum. *See* RECTOR.

Consumption and School-work.—Consumption is one of the most fatal diseases in this country. In 1884, in England and Wales, out of a total of 530,828 deaths, 49,325 were caused by consumption, and 20,083 by other tubercular and scrofulous diseases, which are produced by similar causes to those inducing consumption. Thus, 13 per cent. of the total mortality of this country was ascribable to consumptive diseases. Of the total 69,408 deaths from consumptive diseases, 12,746 occurred under the age of twenty years, and it is evident, therefore, that the question of the influence of school life on the tendency to consumption is one of great importance. Consumption is a very *hereditary* disease, and where the hereditary taint is marked, school work should be modified and the pupil's health guarded by generous diet and abundant outdoor exercise. A *damp soil* has been demonstrated to be a powerful factor in causing consumption. It has been repeatedly demonstrated that when a neighbourhood is freely drained, thus robbing its subsoil of moisture, the mortality from consumption steadily decreases. In Salisbury the deaths from phthisis fell 49 per cent., in Ely 47 per cent., in Rugby 43 per cent., and in Banbury 41 per cent. after free drainage. It is evident, therefore, that schools should be erected on a dry soil, and all precautions taken against damp floors and walls. *Overcrowding* has a very important influence in causing consumption. Dogs in ill-ventilated kennels, horses or monkeys under similar conditions, not uncommonly die from consumption, and the same rules apply to children. The influence of lack of fresh air as a cause of consumption is indicated by the fact that of 6,000 cases admitted into the Brompton Hospital for consumption two-thirds had indoor occupations, and a majority of these were milliners, sempstresses, and tailors. Formerly the death-rate from consumption in the army was 11·9 per 1,000 soldiers; now, with improved ventilation and drainage of barracks, it is only 2·5 per 1,000. Children are especially susceptible to the dangers resulting from impure air. And even if consumption is not directly produced in this way, it is favoured by the general debility and malaise caused by chronic exposure to foul air.

It has been recently stated that consumption is due to a minute organism (the *bacillus tuberculosis*), and that consumption may be caught by breathing the breath of consumptive patients, just as scarlet fever or measles may be caught under similar circumstances. If this be the case, then the dangers of school life

in which children are congregated closely together in a vitiated air are indefinitely increased. But, without accepting this view in its entirety, the importance of fresh air in connection with school life cannot be exaggerated.

The direct influence of school-work in producing consumption has perhaps been exaggerated. The collateral deficiency of food, exercise, and fresh air are probably the real causes of consumption rather than the mental work in school life. In 1872 the Massachusetts Board of Health inquired by circular of a number of physicians and teachers whether in their experience consumption is ever brought on by over-study. Of 191 replies 146 were in the affirmative. There can be no doubt that the strain involved in working for an examination sometimes leads to neglect of hygienic laws, and following on the examination a breakdown may occur; but there is no reason to think that study in itself conduces to phthisis. It should be remembered that children with a tubercular tendency are often unusually bright in intellect, and require holding back rather than stimulating in their studies.

Contradictoriness.—By this term is meant a disposition to dispute and contradict others' assertions, not in the interests of truth, but from a mere love of opposition. It corresponds in the intellectual region with self-will and obstinacy in the moral region. It is not a vice proper to childhood, for children are disposed to accept the statements of those who are able to command their respect. The presence of this fault is thus a pretty clear indication of a lack of authority on the part of the teacher, and of a defective mode of instruction. Clever children, who are invited and encouraged to give their opinion on various matters, and to discuss questions with their preceptors, are very apt to develop this unamiable quality. It is no easy matter to exercise the judgment of the child in independent reflection and decision, without at the same time encouraging a love of dispute. The only true corrective to contradictoriness, love of wrangling, and what Locke calls opinionatry, is a genuine love of truth itself, which leaves no place for any form of self-consciousness, and so excludes all desire for self-assertion. (*See* Locke's *Thoughts on Education*, sect. 98.)

Contrast.—Two things are said to contrast one with another when they show a marked and striking degree of unlikeness. Thus, we speak of a contrast between a loud and a soft note, a warm and a cold colour. Since all knowledge begins by discriminating objects or seeing differences, and since the child notes broad differences before he detects the lesser degrees of unlikeness, early cognition is occupied to a large extent with the relation of contrast. For this reason the teacher should make the amplest use of the principle of contrast. Thus, in exercising the senses and the observing faculty, contrasting colours, forms, &c., should be set in juxtaposition; and in communicating any new idea to the child's mind, as that of patriotism, its meaning should be brought out by contrasting it with its opposite. Contrast has an important bearing not only upon the operations of the intellect, but on the feelings. The emotional effect of anything pathetic, sublime, &c., is greatly enhanced by setting it in its proper contrast. Hence the large part played by contrast in literature and the fine arts generally. Owing to this emotional effect of contrast, impressions are apt to attach themselves to and afterwards to recall contrasting impressions; and this is particularly the case with ideas that are relative one to another, such as bright, dark, high, low, rich, poor, &c. So frequently does one impression or thought suggest a contrasting idea, that some psychologists both in ancient and modern times recognise contrast as one of the fundamental Laws of Association (*q.v.*). It has, however, been clearly shown that this is not necessary. (*See* DISCRIMINATION.)

Convocation. *See* UNIVERSITIES.

Copying is a school offence too well known to need description. It is most often committed in arithmetic, but it may be committed in dictation, parsing, analysis of sentences, grammar exercises, or in fact any work wherein correct answers are identical. The evil effects of copying are twofold. 1. The teacher is misled as to the attainments of his pupils, and thinks the proficiency of the brightest the proficiency of the class. He therefore passes on to the next stage of a subject before the children who require most of his attention are really fit to follow him, and the further he proceeds the more hopeless becomes any attempt on their part to keep up. 2. Thus they fail to acquire know-

ledge, and fail also to acquire a habit of self-reliance. Copying is a mark of low tone and bad discipline. It indicates that the children do not scruple to reap where they have not sown, and that the teacher either cannot see or cannot prevent dishonest work. The remedy consists, primarily, in raising the tone and improving the discipline. Copiers should be made to understand that they at once commit a moral offence and retard their own progress; but the teacher, while he does all that he can to cultivate his pupils' sense of honour (*q.v.*), should watch them vigilantly. Then there are certain mechanical means of rendering copying difficult or impossible. Such are: 1. Seating the children so far apart that no one can see his neighbour's work. 2. Letting the class stand in a semicircle, each child with his back to one neighbour and his face to the other. This arrangement is only possible when exercises are done on slates. 3. Giving different work to alternate pupils. 4. Giving different work to each pupil. This is best done by means of 'test cards.' Many such cards, dealing with nearly all subjects of instruction, are now in the market. Their use is especially calculated to teach self-reliance, and they give practical form to the dictum of an experienced inspector (Mr. Fearon), who says that 'the only way to stop copying in a school is to make it impossible.'

Corporal Punishment is but seldom required in well-managed schools. Few authorities, however, deny its occasional advisability. It should, however, always be executed after due deliberation and a considerable interval of time from the moral delinquency for which it is deemed necessary. Boxing the ears or blows on the head of any description are inadvisable, and even dangerous. So likewise are blows on the front of the chest or abdomen. The best site for corporal punishment is the region of the seat, and a flexible cane should be used, not a hard, rigid rod. It should always be quite clear to the delinquent that the punishment is not vindictive (an interval of an hour or two impresses this), and corporal punishment should be reserved for extreme moral sins, and not used for breaches of discipline. Skilled teachers, especially in higher class schools, are gradually learning to maintain discipline without any recourse to corporal punishment. Where corporal punishment seems absolutely required, it is a good plan to hold over the infliction of the chastisement during the continuance of good behaviour, having it understood that if the good behaviour continues for a given length of time, the sentence to corporal punishment will lapse. (*See* DISCIPLINE.)

Courage has been recognised in ancient and modern times as one of the leading virtues. Aristotle, agreeably to his general ethical conception, regards courage as a mean between two extremes, excess and deficiency of fear—that is, cowardice *v.* foolhardiness. He also distinguishes true courage, which includes a sense of danger and a resolve to face it, from its spurious forms, as the coolness shown by one whom experience has taught the groundlessness of fear. To courage, which implies a readiness to face danger, is closely allied endurance or fortitude in bearing what is painful. The moral value of courage depends very much on the quality of the motive that lies behind it. Thus, a boy who shows contempt for danger merely to earn plaudits of lookers-on illustrates a less admirable form of courage than one who risks peril to save another's life. The fostering of a spirit of bravery and endurance in children, who are naturally disposed to be timid, is an important part of moral training. This begins with the cultivation of physical courage, i.e. a readiness to face and endure bodily pain. Next to this comes the higher task of developing moral courage, or resolution in meeting other forms of suffering, particularly ridicule and contempt. Children should be carefully taught to discriminate genuine from spurious courage, and not to confound a manly readiness to face danger where occasion requires with a foolish recklessness. (*See* Mrs. Bryant's *Educational Ends.*)

Course of Instruction. *See* INSTRUCTION (COURSE OF).

Cowper-Temple Clause.—The name given to sub-section (2) of section 14 of the Education Act of 1870, from Mr. Cowper-Temple, the member who proposed to the House of Commons the wording of the sub-section in the form which was ultimately accepted by Parliament. The words are: 'No religious catechism or religious formulary which is distinctive of any particular denomination shall be taught in a school' provided

by a School Board. (*See* CONSCIENCE CLAUSE.)

Cramming.—This term was introduced into the educational vocabulary about the time of the establishment of the system of open competition for appointments in the public service, when the demand naturally arose for tutors to undertake the preparation of candidates for the various examinations which that system instituted. Owing to a belief which became current that this preparation frequently consisted of rapidly crowding the mind with superficial or merely mnemonical knowledge of facts and principles, rather than training it to a thorough mastery and accurate generalisation and analysis, tutors came to be called crammers, and their process cramming. The term, however, is frequently misapplied to the close application or concentration to the work of preparation, in which rapidity and thoroughness are combined. It should be confined to the overloading of the memory with knowledge acquired for an objective or materialistic purpose, and not for its own sake and purposes of culture and mental development. Cramming would cease to exist under a proper system of examination, for a good examiner can always put questions to test whether the candidate's training has been conducted on the forcing principle, or on that of natural healthy growth. Cramming is not confined to those engaged in preparation for public examinations; it is common in schools where the practice of committing lessons to memory and stuffing the mind with ill-digested facts is still followed.

Crêches.—Institutions of French origin, where infants from fifteen days old to three years are taken care of during the daytime while their mothers who are obliged to be at work are absent from home. The first crêche was opened by Madame Marbeau of Paris (1844). Crêches are now in use not only in France, but also in Italy, Belgium, Holland, and England. The children are entrusted to the care of properly trained nurses, who wash, nurse, feed, and amuse them, instructing them also, if they be old enough, on the kindergarten system.

Criss Cross Row, or Christ Cross Row.—A designation formerly applied to the first line or row of the alphabet arranged in the old horn books or primers. These books consisted of only a single page, and the letters were printed commencing with a + A, a, b, c, &c., a, e, i, o, u, A, B, C, &c. The first line commencing with a cross was called the Christ Cross Row, or, more shortly, the Cross Row.

Cruelty to Animals.—By this phrase we understand the appearance not only of indifference to the feelings of animals, but of a positive pleasure in ill-using them, which is a common characteristic of children. How far the practices of pulling flies to pieces, tormenting cats, &c., involve a delight in inflicting pain is a matter of dispute. Dr. Bain regards this feeling as the essential element in all cruelty, and as a primary instinct of the human mind. It may be contended, however, that much of children's apparent cruelty is the outcome of a more general love of wanton destruction and of delight in exercising power. Locke thinks that children's seeming delight in inflicting pain is none other than a foreign and introduced disposition. Certain it is, that before custom blunts the edge of their feelings children are often keenly sensitive to forms of ill-treatment of animals which have the sanction of convention. Where a child is disposed to be cruel, care must be taken to cultivate kindlier feelings and to exercise the imagination in a vivid realisation of the suffering produced. Sympathy with the animal world may be developed to some extent by encouraging children to tend and associate with the familiar pet animals, an idea that entered into Froebel's plan of a kindergarten. It must be remembered, however, that a fondness for pet animals, which are as a rule attractive and likeable, is no guarantee for a wide disinterested kindness towards the animal creation. This last presupposes that the natural antipathies to what is ugly and repulsive in animals be brought under control (compare article SYMPATHY). (*See* Locke, *Thoughts on Education*, sect. 116; Bain, *Education as Science*, p. 72; Miss Edgeworth, *Practical Education*, chap. x.)

Culture.—The word 'culture' in its most general sense denotes sometimes the process by which human forethought tempers and ameliorates the defects of the wild state, sometimes the result of that process. Thus, the word may be applied to the tillage of the soil or the training of plants. In relation to man, culture denotes rather the result of the process of amelioration; a school-boy or school-

girl cannot properly be called 'cultured,' though he or she may be called 'well educated': for culture connotes a certain ripeness of judgment and feeling, and a degree of development in each of the three directions of the intellect, the emotions, and the will. It manifests itself in a certain aptness of behaviour, a capacity for sympathy, a sense when to speak and when to be silent. Culture is concerned with an ideal of humanity, and no attributes that belong to the complete man can be excluded from its scope. But this completeness cannot be attained early in life. Kant finely describes the birth of character as a spiritual revolution which rarely takes place before the age of thirty, and is not often complete before forty. The late Mark Pattison used to say that most men do not learn to *live* till they are forty. Education—the discipline of the school-room, the play-ground, the home—may be said to prepare the way for culture; the attainment of it is the joint work of school and life, though gifted persons may sometimes become cultured without much early discipline, by virtue of a natural endowment or hereditary instinct.

The influences which most directly contribute to culture may be summed up under the words science and art. But by science is not meant merely the science of nature, nor by art merely fine art. Science is organised knowledge, and every body of methodical doctrine that proceeds by way of observation and classification, and issues in the discovery of law, is a science. Science embraces man as well as nature—speech, history, political economy, and so on, as well as physics, chemistry, and botany. In England the word science, like the word culture, is often understood in a more limited sense, but without justifiable grounds; the misuse of the word may tend to confuse educational issues. In Germany no one would think of excluding from *Wissenschaft* the science of antiquity—*Alterthumswissenschaft*—which Wolf and his successors have laboured so energetically to create during the present century. It is indeed quite unscientific to oppose one subject to another as scientific or unscientific; the distinction is not between subjects, but between methods of treating them, and every subject admits of a scientific treatment. Art, on the other hand, is generally recognised as including literary art—the products of literature which aim at satisfying the sense for beauty and style.

Both the attitude of science and the attitude of art are constituents of culture. Until the desire to comprehend is born, the mind remains in a condition of minority. Intellectual manhood is not reached till the masses of knowledge gathered through the years of receptive study—the period of apprenticeship—take shape under the influence of some central idea or dominant purpose. From that time onward the life of the student becomes scientific—a life of discovery, in which conviction (knowledge, ἐπιστήμη) takes the place of opinion (δόξα), and indiscriminate reading gives way to definite problems awaiting a definite answer. The birth of science has a close connection with the birth of character. But the scientific apprehension of things is not in itself sufficient for culture. The method of science is essentially abstract. Science deals with aspects of things, and consciously limits its view in order to give a more complete account of their several phases. It analyses and classifies, and so introduces order into our conceptions, arranging phenomena in the simplest way. But the mind does not find satisfaction if occupied exclusively in this process. The universe is not to be completely apprehended by the method of dissection. What Schiller says of truth generally is especially true of literature:

Dich zu fangen, ziehen sie aus mit Netzen und Stangen,
Aber mit Geistestritt schreitest du mitten hindurch.

('To catch thee they take the field with nets and poles: But thou, like a spirit, passest through the midst of them.') A sense of beauty or of humour is one thing, and inquiry into the *rationale* of the beautiful or the humorous is quite another. A man may be an authority on the Homeric question without having known Homer; he may have swept the field of phenomena to discover a law of chemistry or botany without apprehending Nature as Wordsworth or Turner apprehended her. To the scientific eye the heavens declare the glory of Kepler and Newton; but no amount of science will teach what it is to 'live by admiration,' as Wordsworth thought we should live; no amount of psychology will create or enable a man to understand a Hamlet.

From this point of view it is possible to attempt some answer to the question

as to the rival claims of general culture and specialism. There is something fascinating about the idea of 'all-round culture.' 'Im engen Kreis verengert sich der Sinn' ('In a narrow sphere the mind becomes narrowed'), said Goethe. 'Culture means the compensation of bias,' said Emerson. Dr. Martineau tells us that when a young man he compelled himself to devote his best energies to subjects for which he had no aptitude, leaving those for which he had a gift to take care of themselves. But to attempt to develop oneself equally in all directions is to renounce the chance of being a master in any subject. And specialism has a claim upon the intellectual life too; there is something in the concentration of one's best energies upon a limited field, whether of science or art, which gives force and originality to the mind. A bias is at least a prominent part of oneself; nor does it seem that the true self is best developed by ascetically denying a special bent. Addison compares education to the polishing of a block of marble, by which the inherent beauties of its veins are brought to view. It is an opposite doctrine which compares education to the grafting of a tree; but Archbishop Whately, who uses this metaphor, insists on the presence of some affinity between the stock and the graft. The definition of education given by J. Paul Richter, as 'the process of emancipating the ideal manhood which is latent in every child,' still better recognises the claims of the natural endowment. And there is nothing inconsistent with this doctrine in maintaining that every man should cultivate the attitude of science and the attitude of art. He may find exercise for both energies in a comparatively limited field—even in a single author, Greek, Latin, or modern, or a single department of nature; he may be scientific and artistic without spreading himself impartially over the whole field of knowledge. At the same time it is desirable to lay as wide a basis of positive knowledge as is consistent with concentration and mental repose. And it is a main duty of the science of teaching to determine what are the subjects best suited to prepare the way for culture. Mr. Matthew Arnold, whose definition of culture as 'the knowledge of the best that has been thought and said in the world' is so well known, is strong in his insistence on literature as the best school of 'sweetness and light.' The advocates of physical science lay emphasis on the importance of direct contact with nature—the formative power of the laboratory. Whatever be the subject-matter of study, it should be the aim of the teacher to encourage independent effort. Culture does not result from the attempt merely to appropriate other men's thoughts as recorded in books, but rather from a gradual widening experience of things—an experience in which the personal activity of the student is a prime factor.

Cumulative Voting. *See* LAW (EDUCATIONAL).

Curiosity is a name for the love of knowledge, showing itself in an active form as a desire to gain the same. It implies more or less distinctly a consciousness of ignorance about a subject, a feeling of discontent, and a belief in ascertainable knowledge. Curiosity is the natural and proper incentive to the act of attention, and the concentration of the thoughts on a subject. Hence it is the first business of the teacher to arouse curiosity with respect to the particular subject and points which he is about to set forth. Curiosity is commonly recognised as a leading characteristic of the childish mind. The newness of its surroundings and the consciousness of ignorance naturally favour a desire for information. And in truth the child when unchecked is a pertinacious questioner. It has been seriously maintained by Dr. Bain that much of this questioning is not the outcome of genuine curiosity at all, but is a display of egotism, a delight in giving trouble, &c. It is probable, however, that injustice is here done to the childish mind, and that, as Locke and others maintain, the development of the childish intelligence is often retarded by discouraging the spirit of inquiry. At the same time it must be admitted that childish curiosity differs in some material respects from the more mature product which we call scientific curiosity. It is fitful and fugitive, and inadequate to sustain a prolonged effort of concentration, and it wants the definiteness of direction which characterises the inquisitiveness of a trained scientific mind. Curiosity must be distinguished from a blank feeling of wonder at what is new and strange, and which, though it may lead on to a desire for knowledge, is apt to become a suffi-

cient satisfaction in itself. Curiosity with respect to any subject is favoured by any form of interest in that subject. (*See* INTEREST.) Lastly, it may be observed that curiosity may be trained in certain definite lines, and so assume the form of a habit. Thus the progressive study of any subject, as natural science or history, serves by successive satisfactions of curiosity to generate further curiosity, and so it is true in a sense that the more we learn the more curious we become with respect to what is still unknown. (*See* Locke's *Thoughts on Education*, sect. 118 and following; Bain's *Education as Science*, p. 90; Sully's *Teacher's Handbook*, p. 400; and article 'Wissbegierde,' in Schmidt's *Encyclopädie*.)

Curriculum. *See* INSTRUCTION, COURSE OF.

Curvature of Spine, especially that form known as 'lateral curvature,' or 'growing out of the shoulder,' is not infrequent during school life, more especially in girls about fifteen years old or upwards. In a slight degree inequality of the two shoulders is almost universal, owing to the right arm being more used than the left. In a more marked degree it requires special gymnastics to strengthen the weak muscles of the back and shoulders, and in extreme cases some spinal support may be necessary. Desks and seats improperly constructed or arranged are largely responsible in starting curvature of the spine. If the desk is *too high*, the left shoulder is unduly raised in order to support the arm on the desk, and thus a lateral twist of the spine is induced. If the desk is *too low*, the scholar has to bend too low over his work, and thus he becomes round-shouldered, while nearsightedness is apt to be produced. (*See* EYESIGHT.) If the desk is flat, or too far in front of the seat, cramped positions are induced, tending to produce deformity. Seats improperly arranged have a similar tendency. If without a back-rest, or with an improperly adapted back-rest, the pupil leans forward on the desk, and thus his lungs are cramped and his shoulders rounded.

Curwen, John. *See* TONIC SOL-FA.

Cuvier, Georges (*b.* 1769, *d.* 1832), was the son of a half pay officer in a Swiss regiment in the French service. He received his early education from his mother, who was a most accomplished woman. He studied at Tübingen and Stuttgart. There he began to devote his attention to natural history. At the age of twenty-one he was appointed tutor to the son of Count d'Héricy in Normandy. The house was by the sea, and Cuvier studied marine animals and fossils, and made researches into the anatomy of mollusca in particular. From this may date his comparative anatomy and the distinction he achieved in science. In 1800 he was appointed Professor of Natural Philosophy in the Collège de France, and at the same time he lectured on comparative anatomy in the Jardin des Plantes. After receiving many honours from Napoleon, he was charged in 1809 with the organisation of the new academies. He organised those of Piedmont, Genoa, and Tuscany, and brought to bear upon his work the experience he had gained in former years when he was appointed by Napoleon to establish the public schools supported by the Government. In 1811 he was sent to Holland on a similar errand, and he paid great attention to elementary instruction. His principle was that instruction would lead to civilisation, and civilisation to morality. He said, 'Give schools before political rights.' In 1813 he went to Rome to organise the universities there, and by his tolerance he won the highest praise. He gave a great impetus to the study of science, and was rewarded with many honours by the State.

D

Dactylology (Greek δάκτυλος, a finger).—The art of communicating ideas by signs made by the fingers which by an ingenious arrangement can be made to represent the various letters of the alphabet. This method is sometimes called the deaf and dumb alphabet, because used by those thus afflicted. The alphabet is termed single or double with reference to the employment of one or two hands. (*See* EDUCATION OF DEAF MUTES.)

Dame Schools.—So called from the circumstance of their being conducted by women, usually in country places where superior education was not available, and confined to the humbler classes of chil-

dren, usually of tender years. Shenstone in his *Schoolmistress* has looked upon the Dame's School with a poet's eye and immortalised it.

Dancing is the art of expressing inward feeling by movements of the body and limbs, and has been well defined as the 'poetry of motion.' Like music, its natural accompaniment, it has been cultivated by all nations, in all ages. Amongst the ancient Hebrews, Greeks, and Romans, as also amongst the early Christians, dancing was associated with religion, and was practised at public worship as well as at public festivities. The Greeks elevated dancing to a fine art, Aristotle ranked it with poetry, and it was an essential subject in the educational code of the Spartans, all Lacedæmonians having been compelled to exercise their children in dancing after they had attained the age of five. The Spartan youth were also trained in the public place to practise the Pyrrhic dance, a military exercise, illustrative of the onslaught upon an enemy. The love of dancing by fighting men of modern times, notably by British sailors, seems to be a survival of the ancient relationship between dance and war. Nelson declared that all that it was necessary to teach a sailor was to dance and speak French, 'the rest,' he said, 'would come by instinct.' Locke attached great value to dancing, and strongly recommended it as necessary to the completeness of the education of a gentleman. 'Dancing,' he says, 'being that which gives *graceful motions* all the Life, and above all things Manliness, and a becoming Confidence to young Children, I think it cannot be learned too early, after they are once of an Age and Strength capable of it. But you must be sure to have a good Master, that knows, and can teach, what is graceful and becoming and what gives a Freedom and Easiness to all the Motions of the Body. One that teaches not this is worse than none at all: Natural Unfashionableness being much better than apish, affected Postures; and I think it much more passable, to put off the Hat and make a Leg like an honest Country Gentleman, than like an ill-fashioned Dancing Master. For as for the jigging Part, and the Figures of Dances, I count that little or nothing, farther than as it tends to perfect *graceful* Carriage.'

Darlington Training College. *See* BRITISH AND FOREIGN SCHOOL SOCIETY.

Darwinism. *See* EVOLUTION.

Day Schools.—These are schools established for the education of the young without severing them from the influence of the home. For boys under fourteen years of age and for girls generally it cannot well be doubted that they are better than boarding schools. Nothing can adequately take the place of the gentle and ennobling influences of a well-ordered and happy home; and no one is so well fitted or so likely to exercise that constant sympathy and watchfulness, that patient personal care, which are so important in the education of younger children, as a good mother. But in later school life—at least in that of boys—the balance of advantage is rather in favour of the boarding school. During this period the acquisition of knowledge rapidly grows in importance, whereas before training was everything; and it must be always extremely difficult in an ordinary home to make proper provision for an entirely satisfactory child life at this stage, and for the acquisition of knowledge being carried on in an orderly manner undisturbed by other influences. While if the children are kept entirely apart, the benefits of the home life are lost. Again, one of the most valuable parts of the training in the later school life is that which calls into play a feeling of oneness with one's fellows, of forming a part of a great whole; a sense of having responsibilities and hopes and fears in common with others, of working with others for a common good, of suffering with others for a common ill. Experience has shown that it is impossible to give this training effectively when the interests of the school life are divided with, and often overbalanced by, those of the home. Lastly, the value of school games in teaching boys management, self-restraint, and manliness cannot be overlooked; and it is extremely difficult, if not impossible, to maintain these in continuous and healthy vigour when boys must regulate their movements by the requirements of home, and must perforce spend much of their spare time in going to and returning from school. The development of *esprit de corps*—or a pride in working for and sharing in a corporate reputation—and the exercise of school games are not at present considered essential parts of the sound education of girls (*q.v.*); while undoubtedly in their case a more intimate knowledge of do-

mestic life is of the highest importance. Hence the above arguments—except the first—cannot be said to apply to them with any great force.

Deaf Mutes. *See* EDUCATION OF DEAF MUTES.

Degrading.—When an undergraduate is permitted to go down for a number of terms before he completes his period of residence, he is said to have degraded.

Degrees are either *honorary* or are conferred after examination. As a general rule, they are confined to the Bachelor, the Master, or the Doctor's degree. These degrees are usually bestowed by universities specially chartered for the purpose; but in some countries high official personages—the Archbishop of Canterbury, for instance, in England—have the power to bestow them. The regular mode of obtaining a degree is by spending a certain amount of time in a university, and by showing proficiency in the branch of knowledge in which the candidate seeks to graduate. Nearly all universities possess four great faculties, namely, those of theology, medicine, law, and arts. In some —e.g. the University of London—the faculty of theology is omitted, and those of science and music are introduced. In the greater number of British universities the faculty of science has been adopted as an integral part of the university ; but the faculty of music remains as a survival of an older growth, when there were, as in Oxford, a large number of subsidiary faculties entitling those who qualified in them to a certificate of merit. Similar certificates are often conferred by colleges which do not form an integral portion of a university, but which are chartered to carry out some special object. There are, for instance, twenty medical corporations in the United Kingdom entitled to issue licences to practise. To a physician, however, a university degree is practically indispensable, but to the surgeon the fellowship of his college is nearly as good a qualification as any mark of distinction a university could bestow. Of degrees, properly so called, there are two great divisions: those which are conferred as the reward of personal study and examination, and those bestowed for other reasons. As regards the former, they may be divided into two classes, namely, pass and honour degrees. In Oxford and in Cambridge the student may either undergo a mere qualifying examination in arts or in medicine—it is somewhat different as regards theology and law—or he may enter for honours. The actual degree conferred is the same in both cases, but the educational value of the two things is widely different. When the Bachelor's degree has once been obtained, the superior grades follow as a matter of course, subject to the payment of fees, and to the performance of certain exercises which are always more or less formal. Thus a Cambridge B.A. may, by taking up two or three papers in the law tripos, become first of all a Master, and then a Doctor of Laws, or else he may elect to become a Master of Arts, in which case he will have nothing to do except to pay a certain amount of money and to present himself before the vice-chancellor. If he prefers to take up medicine or surgery, he is exempt from all preliminary examinations in general knowledge ; and should he decide upon seeking a degree in theology, he has nothing further to do except to take his Master of Arts degree, and to perform one or two exercises before the theological professors.

The Bachelor of Arts degree, which as a rule requires three years for its attainment, is the keystone of the entire system. The designation of a Bachelor was introduced by Pope Gregory IX. into the University of Paris (thirteenth century), and denoted a student who had passed certain preliminary examinations but was not yet qualified for admission to the rank of Master, Doctor, &c. To obtain a B.A. degree at Oxford candidates must complete twelve terms of residence and pass the following three examinations : 1. Responsions or 'smalls' before the masters of the schools. 2. The first public examination or 'moderations' before the masters of the schools. 3. The second public examination before the public examiners. Candidates for honours have subjects in addition to those required for a pass degree. For the B.A. degree at Cambridge nine terms of residence are necessary, instead of twelve as at Oxford. At both universities, however, the time usually required to keep the terms is the same, a little under three years. For a pass Cambridge degree the following examinations are required : 1. The previous examination, or 'little-go.' 2. The general examination. 3. A special examination in theology, moral science, law and modern

history, natural science, mechanism and applied science, music, or modern languages. For an honours degree candidates have an 'additional examination' as well as the previous examination, but omit the general and the special. After the 'additional' they have no other examination until they take the tripos at the end of the third year. A Bachelor of Arts proceeds to the M.A. degree at the end of three years without further examination.

Different regulations for graduation obtain in the other universities, and as it is beyond the scope of this work to detail them we must refer the reader to the respective university calendars. In London, for instance, a matriculation examination open to candidates who have attained the age of sixteen is the first test required of students intending to proceed to degrees in the various faculties. Then for the Bachelor's degree two examinations (first B.A., second B.A.; first B.Sc., second B.Sc., &c.), at intervals of not less than a year each, have to be passed. For the full degree in arts, and also in science, the successful candidate must prove that he is a specialist in one of the subjects in which the degree may be taken. The London University examinations, being open to all comers without distinction of creed or sex, and to private students, as well as to those who have had the advantage of a collegiate training, are more severe than those of other universities, and consequently have a high academical value, considered merely as tests of ability and attainments. It is a peculiarity of the Scottish universities that the Bachelor's degree in the faculty of arts, though not in the other faculties, has been abolished, and candidates proceed to the M.A. degree by passing (either separately at intervals in the curriculum, or all together at the close of it) three examinations, viz. one in classics, one in mathematics, and one in philosophy. An M.A. *certificate* is given in each department, and the holder of all three certificates can obtain the *diploma* by presenting himself at the public ceremonial of graduation. Both in the American and some of the British and Colonial universities candidates for the full degree in science (D.Sc.) have the choice of a considerable number of subjects, including such eminently practical ones as engineering, public health, &c. Special examinations for teachers are now also held in London and other universities, and diplomas granted to successful candidates. With regard to honorary degrees, they are bestowed either as a reward for writings and investigations in a particular branch of learning, or they may be degrees granted *ad eundem* as a matter of courtesy to those holding analogous rank in other universities; or, last of all, they may be purely honorary titles, meaning nothing except that they are an expression of the desire of a given university to do honour to certain individuals.

Women are now admitted to degrees in London, St. Andrews, Durham, and the Victoria University, and in the Royal University, Ireland. In every other university special examinations are provided for them, and in Cambridge they are allowed to take the same papers and to be classed in the same examinations with male candidates for degrees.

Delphin Classics.—An edition of the Greek and Roman authors, prepared in the reign of Louis XIV. by thirty-nine eminent scholars of France, under the joint editorship of Bossuet and Huet, tutors to the Dauphin (Lat. *Delphinus*). English editions of some of the authors in the series were published. The scholarship of the editors of these once celebrated volumes is now out of date.

Desks. *See* FURNITURE.

Development comprehends the series of changes through which every living thing passes in the course of its life-history, and the order of which is, in its main features, determined by the species of which it is a member. The movements of development, as the word and the related term evolution suggest, are regarded as springing out of certain latent tendencies inherent in the organism itself. Development thus contrasts with all series of changes mechanically impressed upon a body by an external force, as, for example, the formation of a statue. Yet while the result of the internal activity of the organism itself, it presupposes an environment with which the organism continually interacts. Thus the due development of a plant depends upon the presence of nourishment, heat, light, &c., which are necessary to the exercise of its proper functions. We may thus distinguish in all development two factors: (1) an internal, consisting of the forces and tendencies residing in the organism; and

(2) an external, viz. a suitable environment to act upon and call forth reactions from the organism. Development is distinguished from mere growth or increase in bulk by the characteristic of advancing differentiation and complexity of structure. Thus the development of a brain means progress in unlikeness of parts, and in complexity of arrangement between part and part. Mental development, like physical, is characterised by increase in distinctness of parts and complexity of structure. In other words, knowledge passes from the vague to the definite stage, and from simple to complex forms. Again, mental development, like physical, may be viewed as the product of internal and external forces acting and reacting one upon another. Normal mental development presupposes the germ of the normal human faculties at the outset. Moreover, the rapidity of the process of development, its duration, and, lastly, the special lines which it follows, are determined by the innate powers and dispositions of the individual. At the same time the action of surroundings is an essential condition to the realisation of these original capacities. Under this environment we must include not only physical objects fitted to stimulate the senses and furnish elementary impressions to the mind, but also human beings or society, the presence of which is necessary to that higher intellectual and moral development which distinguishes man from the lower animals. The development of a human being as a whole is the sum of its physical and its mental developments, which are intimately connected, and powerfully react one on the other. The effect of physical development on mental is seen in the fact that at every stage the latter is limited by the degree of structural complexity reached by the brain, by the well-known consequences of the physical changes which take place at the age of puberty, &c. On the other hand, a too rapid development of brain and mental faculty tends to retard, and in extreme cases even to arrest, the general movement of physical growth. Writers on education have attempted to mark off different periods of human development, as infancy, childhood, youth, &c., which periods are determined partly by physical, though mainly by mental changes (cf. article EVOLUTION). (*See* H. Spencer's *Principles of Psychology*, vol. i. parts iii. v.; Sully's *Handbook of Psychology*, chap. v. and Appendix A; W. H. Payne's *Contributions to Sc. of Ed.*, chap. iv.; Schmidt's *Encyclopädie*, art. 'Entwicklung'; and Buisson's *Dictionnaire de Pédagogie*, art. 'Évolution de l'Individu.')

Diary. *See* LOG-BOOK.

Dictation.—This is a method employed for teaching to spell. The teacher reads aloud, and the pupil writes down what he hears read. For a language phonetically perfect—in which every separate sound is represented by a single letter, and every letter has but a single sound—the plan would be a wholly satisfactory one, provided that the reading were audible and perfectly clear. For the writing of English, however, we have to trust more to the memory than to the ear. The memory of the eye—of how the word looks when written—is a specially valuable aid. We should be careful to appeal to this memory when dictating; and we may best do this by requiring the pupil to read silently two or three times the part of the page about to be dictated, so that he may have the 'look' of the words fresh in his mind; and when in difficulty may be exercised in recalling *how the word looked* on the page just read. In the same way to write out what has just been learnt by heart is a good exercise.

Diderot, Denis (*b.* at Langres 1713, *d.* at Paris 1784), was the son of a master cutler, and was intended for the law, but he abandoned this for literature and philosophy. In literature he undertook any work that came in his way, from making catalogues to writing stories. He wrote *Letters on the Blind* in 1749, for which he received some months' imprisonment. He was joint editor of the *Universal Medical Dictionary*; then he formed the project of a general Cyclopædia, of which he wrote a great part, and in the editorship of which he was assisted by D'Alembert. He also wrote other works, including *Le Neveu de Rameau*, which was translated by Goethe. Catherine of Russia, hearing of his intention to sell his library, bought it at its full value, and settled a pension upon him as her librarian. This was about 1775, and it is owing to this step that he comes before us as an educationist, for Catherine requested him to give her a plan of a university for Russia. He first claimed that education was for all: 'from the highest official to the lowest peasant each man ought to learn reading,

writing, and arithmetic.' He placed before the Russians, as their model, the system of education then well organised in Germany. Catherine ordered some schools to be established, in accordance with this advice. Diderot insisted that attendance should be compulsory, and to enforce this by law he was satisfied that education should be free. He insisted that all children were to be regarded as 'foundation scholars' of the State, and were to be kept at school at the expense of the State. Not only books, but also food was to be furnished for them. In sketching a course of higher education, Diderot followed, to a large extent, the method of the University of Paris, which recognised four faculties; but of course the faculty of theology and the faculty of law both underwent considerable changes, and were put in the background. Like so many of the French reformers in education, he turned from the old method, and made the centre of true education to be not classical languages, but science. Out of eight classes or divisions under the faculty of arts, he devoted the first five classes mainly to science. His insight into the theory and practice of education was very considerable. He lived in St. Petersburg, greatly charmed by the lavish favour of the empress. On his return to Paris, she took sumptuous lodgings for him, but he only enjoyed them twelve days. His last utterance was, 'The first step towards philosophy is incredulity.'

Diesterweg, Friedrich Adolph Wilhelm (*b.* 1790, *d.* 1866).—An eminent German writer and pedagogue. After a distinguished university career, he became successively teacher at Worms gymnasium and Frankfort model schools, and director of a primary normal school at Mörs (1820–32), and was afterwards appointed (1832–47) director of the normal school at Berlin. Diesterweg was a voluminous writer, his first work, published 1820, being on education in general, and scholastic education in particular, followed by *Wegweiser zur Bildung für deutsche Lehrer* (1834), *Beiträge zur Lösung der Lebensfrage der Zivilisation* (1836–38, 4th ed.), *Lehrbuch der mathematischen Geographie und populären Himmelskunde* (1840), *Pädagogisches Jahrbuch* (1851–66), *Pädagogisches Wollen und Sollen* (1856, 2nd ed., 1875); *Diesterweg, sein Leben und seine Schriften* (1867); *Diesterwegs Selbstbeurteilungen, aus seinen Schriften gesammelt* (1873), besides other works. He also was in his earlier years a contributor to the *Rheinische Blätter*. Diesterweg was an ardent educational controversialist, and engaged in the dispute respecting the merits of the Lancastrian system (*q.v.*), which he opposed. He also controverted the use of classical languages in normal education. He followed in the path of Pestalozzi (*q.v.*) and Rousseau (*q.v.*), and was an ardent apostle of the natural method as opposed to mechanical instruction, and an earnest advocate of the development of the natural faculties. His principles were embraced by a large number of masters whom he imbued with his own spirit and enthusiasm.

Diet.—Children's food should be generous and abundant. Not only have they to keep in repair the tissues of the body, and supply force for carrying on the functions of the body, but also to build up new tissues in the process of growth. In addition, their bodies expose more surface in proportion to their size than adults, and they therefore require a proportionately larger amount of food to compensate for loss of heat. If the food supply is scanty, growth will be stunted, or some of the organs of the body will suffer. A half-starved brain cannot do as much work as one well-nourished, and is also more prone to disease. Food and work are closely related. The more brain-work a child does the more food he requires. This is just as true as in the analogous case of muscular exercise. According to De Chaumont a child weighing 100 lbs. (i.e. about fifteen years old) requires about 3 ozs. of albuminate or nitrogenous food, 2½ ozs. of fat, 12 ozs. of carbohydrates (starch and sugar), and about ¾ oz. of mineral matter, per diem. In working out any given dietary, it is convenient to remember that bread contains about 8 per cent. albuminates (and 50 per cent. starch), meat 15 per cent. albuminates, cheese over 30 per cent., and peas and beans, generally 22 per cent. Nearly all children's dietaries err in deficiency of fat, though they contain abundance of starch and sugar. This deficiency may be made up by dripping, butter, and suet puddings in addition to the fat of meat. Milk forms an important part of children's dietaries. Alcoholic drinks should never be given except under medical responsibility. The *water* supplied at school should be pure and above suspicion. It should be derived,

in town, either directly from the water-main, or from a cistern separate from that supplying water-closets and having its overflow-pipe discharging in the open air. In country places shallow wells are always a source of danger. If a filter is used it should be frequently cleansed, or it may do more harm than good.

Diploma (Gr. *δίπλωμα*, anything folded or doubled) was originally applied to official documents written on folded wax tablets, and subsequently was the name given to royal charters and State papers, (hence *diplomacy*, the science of government documents). Academically the word is used to signify the certificates granted by universities and colleges as evidence that those upon whom they are conferred have graduated in some faculty, or as a licence to practise certain callings. A teacher's diploma is granted by the University of London.

Discipline in its wider sense means the whole system of instruction to which the learner or *disciple* is subjected, and is thus almost interchangeable with the terms 'training' and 'education.' In its narrower sense discipline refers to the maintenance of authority. The system of school government, with its definite rules, its punishments, and its rewards, is a condition of systematic teaching, and so may be viewed as subserving the end of intellectual instruction. At the same time it is evident that authority and command work through the agency of the child's will. In this way discipline comes to have a special connection with the exercise and formation of the will—in other words, with what we mark off as moral education. The imposition of commands, by exercising the child in self-restraint and by inducing a habit of obedience, is the great means by which the early training of the will is effected, and the foundations of moral habit and good character established. The merits of any system of discipline must be tested by the measure in which it attains its ends, intellectual and moral. The general conditions of an effective discipline are such as follow: (*a*) the rules laid down to be intelligible and to be uniformly enforced, (*b*) the rules to be as few as possible compatible with the securing of the necessary objects, (*c*) the avoidance of everything like capriciousness and unfairness in the application of the rules to individual cases, (*d*) the recommendation of the rules laid down by first calling forth the child's feelings of respect for and confidence in his ruler, and afterwards, as he advances in years, gradually enlisting his intelligent approval and support. An important part of the theory of discipline concerns itself with the subject of punishments and rewards (*q.v.*) (cf. articles OBEDIENCE, MORAL EDUCATION, PUNISHMENT, and REWARDS). On the nature and conditions of early government and discipline see Locke on *Education*, sects. 32 and following; Bain's *Education as a Science*, pp. 100–112; Sully's *Handbook of Psychology*, pp. 471–477; and Fitch's *Lectures on Teaching*, lect. iv.

Discipline of Consequences. *See* CONSEQUENCES.

Discrimination.—By an act of discrimination we mean the distinguishing of one impression or object from another so as to discern the exact points of difference between them. Thus a child discriminates one musical note from another, the ellipse from the circle, and so forth. The sense of difference constitutes one of the fundamental constituents of intellect, side by side with assimilation, or the sense of similarity. It may be said that a child's first step towards knowledge is the discernment of the unlikeness of one sense-impression to others. Thus it comes to know its mother's face and voice by remarking their peculiarity, i.e. their points of dissimilarity to other objects of sight and hearing. And throughout the progress of knowledge discrimination enters as an essential element, determining the degree of definiteness and exactness of all our ideas, our judgments, &c. A complete act of conscious discrimination presupposes that the objects or ideas to be distinguished are brought simultaneously before the mind. Thus a child learns to discriminate one letter from another by looking at the two side by side or in juxtaposition. This completed act of discrimination is the outcome of comparison, and implies that the attention is closely fixed on the two objects in their relation one to another. The power of discrimination is in a manner opposed to the other fundamental intellectual endowment, that of assimilation. Where we are strongly impressed by some similarity between things we find it hard to discover difference, and *vice versâ*. Although a vague sense of difference mani-

fests itself in the earliest perceptions of the child, the finer acts of discrimination are reached with difficulty, and only as the result of careful practice. This is seen in the way in which children first lump together under the same name different species of animals. The sense of similarity here overpowers the sense of difference. The opposition between the two is seen further in the fact that one may greatly preponderate over the other in a particular individual. The training of the child in discrimination constitutes the main part of the education of the senses. And throughout the whole work of instruction it should be one ruling aim of the teacher to develop the power of discriminating objects and ideas readily and accurately (cf. article SENSES).

Disobedience. *See* OBEDIENCE.

Distribution of Time.—Before we can hope to make a satisfactory distribution of time amongst the various subjects of a school curriculum, it is quite clear that we must first establish the educational values of those subjects—both as instruments for training the faculties, and as the suppliers of information which is really needed. Until this is done, the amount of time which is given to this or that subject will mainly depend on whim or fancy, and the amount and kind of demand which the public make for it. For instance, at Eton, Harrow, and Rugby the main demand is for Latin and Greek ; and so out of some fifty hours a week of work in and out of school, the highest classes at these schools devote about thirty to classics, as against some six hours to mathematics—while on the military and engineering side at Clifton, classics get only twelve hours and mathematics eleven hours. In German *Gymnasiums* and French *Lycées* the distribution of time, as far as regards classics and mathematics, is very much the same as at Eton and Harrow ; while in a *Real-gymnasium* it is much the same as that just given for Clifton. (See *Journal of Education*, Sept. 1881.) Teachers in English schools are rapidly coming to the conclusion that the very unsatisfactory results obtained in modern foreign languages, though in part due to a mistaken method and poor teaching, are mainly due to the smallness of the time allotted to them. Probably five hours a week (including preparation) is the *least* that can be safely given to either French or German. Whatever be the total amount of time given to a subject, short lessons at short intervals will almost invariably be found to be productive of better results than long lessons far apart—especially in the case of younger pupils. Languages, with their severe tax on the memory, and their general lack of interest for children, will always be found to require more time than mathematics, which appeals more to the reasoning powers, and more readily gives the learner the power of applying what he has learned to the doing of something which he cares about. While again, science, with the interest and curiosity which it excites, and the involuntary work which it thereby causes to be done, may with safety, in its earlier stages, be allowed even less time than mathematics. Speaking generally, it is usually found wise to secure two lessons at least on each subject every week—and with History, English Literature, and Geography probably two each will be always found sufficient. For Arithmetic four lessons is the minimum in the case of beginners ; while drawing, writing, and reading should each have one short lesson a day in the period during which they are taught. When drawing becomes Art, it will require longer spaces of practice, twice a week, instead of the short daily exercise. (Besides the 'Time Tables' of our public schools in the *Journal of Education* already referred to, much useful information will be found in Mr. Charles Bird's *Higher Education in Germany and England.*)

Diversions. *See* RECREATION.

Domestic Economy, or the art of household management, is now taught to girls as a specific subject in public elementary schools, and also in many private schools. *Cookery*, which may be regarded as one of the most important branches of this subject, is practically taught to girls in the last year of their attendance at the elementary schools. Grants have been offered by the Government in the hope of making cookery a part of the ordinary course of instruction. Lessons in it, if properly given, will be found to be not only of practical use, but to have great effect in awakening the interest of children, who, according to the Code, are not only required to be present at a lecture or demonstration in cookery, but to be efficiently taught 'with their own hands.' The cookery grant to schools is conditional on the supply of

proper apparatus and utensils for the purpose of practically illustrating the art.

Don.—The name applied to resident professors and other officers of the colleges at the Universities of Oxford and Cambridge.

Dormitories (School) should never be used during the day for study or other purposes; but the windows should be kept widely open during the whole day. Open bedrooms are preferred to separate cubicles by those having large experience in the moral management of boys in large schools; with the former a more complete supervision, and therefore a greater freedom from vicious habits, can be ensured, and in addition freer through ventilation is obtained. Inasmuch as the pupil spends nearly one-third of his time in the bedroom, its atmosphere should be made as pure as possible by free ventilation and thorough cleanliness in all the arrangements. Even with the best ventilation, a pure atmosphere cannot be secured unless a sufficient cubic space is allowed for each pupil. At least one thousand five hundred cubic feet of fresh air are required by each pupil per hour; and if the air is changed more than three or four times an hour, violent draughts are produced. Hence it is necessary that three hundred and seventy-five to five hundred cubic feet of space should be allowed for each scholar in the bedroom, and preferably the latter amount. This is when the ventilating arrangements are perfect, as they seldom are. Children, like their elders, will close up any aperture from which an unpleasant draught proceeds. Dr. Dukes, the physician to Rugby School, urges that taking a school-bed at three by six feet, the superficial area of the bedroom should be six by twelve feet per pupil, and the room twelve feet high. This gives eight hundred and sixty-four cubic feet per head, which, allowing for the air displaced by the furniture and the boy himself, leaves about eight hundred cubic feet per head. The poor health and pasty appearance of children in boarding-schools are much oftener due to crowded bedrooms than to deficient food or overwork. An essential point in the arrangement of dormitories is that each pupil should have his own towel and brush and comb.

Drainage Arrangements of a School should be of the most perfect character, as children more quickly suffer from sanitary defects than adults. *Lavatories* should be periodically inspected, to prevent obstruction by soap, &c. The waste-pipes should not run directly into the drain, but open over the seal of an interception gully-trap in the yard. *Urinals* should preferably have china or glazed earthenware surfaces, as these hardly allow any sediment. Slate, stone, and cement slabs are not so good, as the rougher surface allows some deposit, and they can be written on. The water-flushing arrangements should be such that the children cannot tamper with them. An automatic flush-tank which empties its contents down the urinals at intervals is perhaps best; or, failing this, frequent washing by a responsible attendant. Five places should be furnished for every hundred scholars. The waste pipe from the urinal should pass into a ventilated trap, and not directly into the drain. *Closets* should never be placed in the basement under the school; but always in a separate building, which may be partially connected with the school by a covered subway. The walls of the closet should be of tiles or some other material which cannot be written on; and all closets should be frequently inspected. There should be separate provision for teachers and scholars, and for the two sexes. The proper allowance is one seat for every fifteen girls or twenty-five boys (Buls). The common privy is most objectionable from a sanitary standpoint. Where it is in use its dangers may be minimised by diminishing the size of the cesspit below the seat and raising it above the ground-level. This necessitates frequent emptying. A further improvement is to throw ashes or dry loamy soil over the contents each day, thus partially converting the privy into an earth-closet. In towns water-closets are preferable. The form known as the pan-closet is always bad, simple valveless closets being most suitable for children's use. They should be made with an automatic flushing arrangement, worked by opening the door or rising from the seat. The water-supply to the closet should be abundant, and from a cistern separate from that supplying drinking water. In order to obtain a good flush of water the cistern should be at least three or four feet above the closet, and the internal diameter of the flushing pipe at least $1\frac{1}{4}$ inch. Instead of isolated water-closets *tumbler* or

trough-closets may be employed, each having a number of seats and a water-tight trough below, the contents of which are only removed periodically by removing a plug and flushing with water. Such a plan requires more superintendence and is more troublesome than isolated closets automatically flushed; but there is less apparatus to get out of order. The *soil-pipe* should be carried outside the school throughout its whole course, and should be prolonged upwards above the eaves as a ventilating shaft. The *drain-pipe* carrying away waste water and the contents of the soil-pipe should be made of iron or earthenware pipes with watertight joints. It should be separated from the main-sewer by a syphon-trap, which is ventilated, thus allowing fresh air to sweep from this end of the drain to the upper end of the soil-pipe above the eaves. A manhole or disconnecting chamber with an air-tight iron cover should lead down to the interception syphon-trap, so as to allow of inspection of the drain. *Cesspools* are occasionally required to receive the sewage where no general system of sewerage exists In this case they should be so constructed as to be watertight, should be small in size, and periodically emptied. They should also be remote from the playground, or from any part to which the children have access. Earth-closets are very valuable in country districts. It is found that 1½ pound of dry loamy earth completely deodorises the closet each time it is used; and this is scattered by an automatic arrangement when the seat is risen from.

Drawing is a mode of representing solid forms by lines upon surfaces. A drawing, as a result of artistic labour, has either a purpose outside of the art, such as anatomical or mechanical drawings and plans, or it is executed for its own sake, such as landscapes and fruit pieces. In the former case their purpose is principally one of material usefulness; in the second they are executed with an endeavour after a beautiful external form, and are thus a representation of the ideal. But those of the first do not exclude the beautiful, for every object can be beautifully represented. Material forms are either natural or artificial, and either geometrical or irregular. There are various species of drawing: (*a*) linear drawing, which gives only an outline of the object, and shaded drawing; (*b*) geometrical drawing, representing objects in their correct relative proportions as to magnitude, and perspective drawing, representing objects as they appear to the eye; (*c*) free drawing and sketching; and (*d*) copying, or drawing from another drawing, drawing from nature, or of real objects, and imaginative drawing, or drawing of things conceived by oneself, of which the two former are of things as they are directly seen, and the third is indirectly based upon the vision of real things. In all drawing, the eye, the hand, and the sense of beauty are employed, as are also, in drawing from memory, the faculty of conception and, in drawing from imagination, the faculty of imagination. Hence the truth of Harnisch's remark, 'the cultivation of the faculties of representation and form gives us a feeling for beauty, grace, form, and symmetry.' Elementary drawing (i.e. drawing of lines, angles, and geometrical figures) is now regarded as an essential branch of primary education, and as such is taught in all schools; while in the army and navy, and in many professions and trades, the ability readily and graphically to delineate common forms, plans, sketch-maps, and scenery, is regarded as an important and a valuable accomplishment. Instruction in drawing should include exercises in understanding, i.e. form in itself, and the beautiful in form, which constitute culture of the eye and of the sense of beauty, and exercises in representing what lies immediately before the student, as in copying and drawing from nature, and what has some time ago been before him, as in drawing from memory and imagination; and these constitute the education of the hand in the service of the eye, and the culture of the memory, the imagination, and the sense of beauty. Both elementary drawing and applied drawing must be practised on the principle *fabricando fit faber*—elementary drawing as a necessary substructure for applied drawing, and applied drawing because the forms of the world around us, without comprehending and representing which neither the formal nor the material object of drawing will be reached, are almost always not plane figures, but solid forms. In this respect drawing is the constant practice of the analysis of forms. The perceptive and the reproductive faculties, to use the language of philosophers, are thus in constant demand and of uni-

versal application. The eye is taught to see all objects more correctly, and the hand is trained to do everything more precisely. There are various modes of drawing, distinguished according to the materials used, such as chalk, black-lead pencil, sepia, or other tinted drawings, which last-mentioned class are sometimes called washed drawings, in which some indication of colouring is occasionally introduced. Pen-and-ink drawings, in the style of etchings, are capable of producing considerable effect; and even more effective are drawings, either in chalk, black-lead pencil, or sepia, done on paper of a neutral tint, with the bright lights put on with white. Water-colour drawing must not be confounded with drawing in its stricter sense, as we have been considering it, for it is a species of painting, although the process employed is altogether different from that of oil-painting. Drawing, as a part of education, was first officially recognised in 1837, when the School of Design in Somerset House was established, which after a migration to Marlborough House (1852–1856) was transferred to South Kensington, where it entered its new buildings in 1863, under the designation of the National Art Training School (*q.v.*). Schools of art (*q.v.*), in connection with the Science and Art Department of the Committee of Council on Education, have also been established throughout the United Kingdom.

Drill. *See* CALISTHENICS and ATHLETICS.

Duke of Newcastle's Commission. *See* ROYAL COMMISSIONS.

Dull Scholars.—Boys and girls of sluggish intellect are to be found in all schools, and the skill and patience of the teacher are much exercised in dealing with them. The success with which dullards are treated, however, is one of the tests of a good teacher, and it is really more creditable to bring out the latent intelligence of stupidity than to foster the growth of precocity. Dulness is frequently co-existent with obstinacy, and then is much more difficult to deal with than when, as is often the case, it is accompanied by gentleness and a disposition to painstaking industry. It should be remembered, however, that there is no child so dull but that it has some faculty or characteristic capable of development. An ear for music, for instance, as Professor Bain has pointed out, is frequently characteristic of dull children, and even of children of weak intellect. An aptitude for mechanism, and an almost instinctive love of accuracy, are sometimes also characteristic of such children. In the treatment of dullards, therefore, the aim should be to unfold their natures, as Carlyle says, so that they may be adapted 'to work at what thing they have faculty for.' The law which Richter has laid down in *Levana* should also be borne in mind by the teacher of dullards: 'Let it be a law, that since every faculty is holy, none must be weakened in itself, but only the opposing one aroused, by means of which it may be added harmoniously to the whole.' Not a few men eminent in literature and science, Liebig, for instance, and Walter Scott, were backward boys at school, and regarded as dull. To lose patience with dull scholars, or to seek to stimulate their sluggishness by calling them dunces and blockheads, or by contrasting their performances with the more brilliant achievements of clever boys, is to afford evidence that the teacher himself has a considerable share of the stupidity he condemns.

Dunce.—This word, which signifies a dullard or blockhead, is of doubtful origin. Some give it a Persian origin, and others have so far exercised their ingenuity as to regard the word as a corruption of Duns (Duns Scotus). Webster, who discredits this derivation, gives the following explanation of it by Stanihurst: 'The term Duns, from Scotus, so famous for his subtill quiddities, is so trivial and common in all schools, that whoso surpasseth others either in cavilling sophistrie or subtill philosophie is forthwith nicknamed a Duns.' This he tells us in the margin is the reason 'why schoolmen are called Dunses' (*Description of Ireland*, p. 2). The word, says Southey (*Omniana*, vol. i. p. 5), easily passed into a term of scorn, just as a blockhead is called *Solomon*, a bully *Hector*, and as *Moses* is the vulgar name of contempt for a Jew. (*See* articles DULL SCHOLARS and STUPIDITY.)

Duty is that which we *ought*, or are under a moral obligation, to do. The term duty thus presupposes a moral law which demands our obedience. With this abstract conception of duty ethical writers give us a scheme of particular duties, as that of Paley: (*a*) duties to others, (*b*) to ourselves, (*c*) to God. It is evident that the child

can only reach so abstract a conception as that of duty slowly, and as the result of experience and reflection. The first crude idea of duty or obligation is acquired by help of positive commands laid down and enforced by the parent or other person in authority. Oughtness at first means what some one in authority bids me do. As with a community so with a child, the sphere of duty is largely determined by custom. What the child is accustomed to do and to see others do, that tends to become a matter of duty or obligation. (*See* MORAL SENSE.)

Dynamics. *See* PHYSICS.

E

Ear (Cultivation of).—This forms one chief branch of the training of the senses. The ear, though it gives us much less direct knowledge of external objects than sight, or even than touch, claims special attention from the educator in the interests both of intellectual and of æsthetic education. There are two distinct modes of sensibility belonging to the ear which it is important to distinguish. These correspond to the differences among musical sounds and among non-musical sounds (*see* ACOUSTICS). The most essential element in the first is acuteness in the discrimination of pitch. This varies in a remarkable way among individuals otherwise endowed with normal hearing, and determines in every case the degree of musical development possible. On the sharpness of the discrimination of pitch depends immediately the appreciation of the relations of melody and harmony alike. It is to be observed, however, that many who are wanting in this distinctive musical sensibility are capable of deriving a good deal of pleasure from music through an appreciation of other features of the art, more particularly rhythm. The discrimination of non-musical quality is illustrated in the detection of most of the characteristic differences among natural sounds, and also in the separation of the many partially similar sounds which make up language. Special sensibility to differences among articulate sounds lies at the basis of what we call a good ear for languages. The well-known fact that this endowment does not vary regularly with musical sensibility, and is often found highly developed where the latter exists only in a rudimentary form, points to the conclusion that they represent two distinct functions of the organ. The cultivation of the ear comprehends each of these two functions. The training of the musical sense is encumbered with a special difficulty arising out of the individual limitations already referred to. It may, however, be safely said that if taken in time the large majority of children are capable of acquiring by proper exercise a fairly acute musical sense. The other chief branch of the education of the ear is the training of the sense to a fine discrimination and accurate identification of articulate sounds. Progress in the use of the mother tongue in learning to read, recite, and so forth, depends on the development of the sense in this direction. More generally the cultivation of the ear seeks to develop quickness and exactness in hearing and taking in the words of others. The attainment of this object implies not only the improvement of the sense in point of discrimination, but the acquisition of a habit of attention. Dulness in hearing in young persons is probably much more often the result of inattention or absence of mind (*see* ABSENT-MINDEDNESS) than of any defect in the organ of hearing itself.

Ecole des Bons Enfants. *See* RENAISSANCE.

Ecole Diderot. *See* TECHNICAL EDUCATION.

Ecole des Arts et Métiers. *See* TECHNICAL EDUCATION.

Ecole Centrale. *See* TECHNICAL EDUCATION.

Edinburgh University. *See* UNIVERSITIES.

Education (Lat. *educatio*) is the science and art of human development, and deals with the training of the bodily organs, the senses, and the intellectual and emotional powers, with a view to securing the happiness of the individual, and the well-being of the society or the state of which he is a unit. Education may be divided under the three headings: PHYSICAL EDUCATION,

INTELLECTUAL EDUCATION, and MORAL (or RELIGIOUS) EDUCATION. Education must be distinguished from *instruction*, which is simply the communication of knowledge for a specific purpose. Education is subjective, instruction objective, but the aims of both may be identical—as when the communication of knowledge involves the development of faculty. In the limitation of its meaning to the work of the schools education is synonymous with PEDAGOGY (*q.v.*). (*See* also ÆSTHETIC CULTURE; CLASSICAL CULTURE; CODE; INSTRUCTION; INTELLECTUAL INSTRUCTION; INSTRUCTION (COURSE OF); LAW (EDUCATIONAL); and SCHOOL MANAGEMENT.)

Education for the Army.—English army schools may be ranged in four classes:

I. Schools for the professional instruction of candidates for commissions: the Royal Military College and the Royal Military Academy. (1) The Royal Military College, Sandhurst (opened at Great Marlow 1802, removed to Sandhurst 1812), affords a special military education to candidates for commissions in the cavalry and infantry. Admission to the college as cadets is granted (*a*) to successful candidates at a competitive examination, (*b*) to graduates in arts of certain British universities, or students who have passed certain specified university examinations, (*c*) to one student annually of the University of Malta and of each of the chartered universities in colonies not having a military college through which commissions in the army may be obtained, and (*d*) to Queen's cadets, honorary Queen's cadets, Indian cadets, and pages of honour, subject to a prescribed qualifying examination. The dates of entrance are February 10 and September 1 in each year, and the number of vacancies varies according to the requirements of the service. The limits of age are: by competition as Queen's cadets, as honorary Queen's cadets, as Indian cadets, or as pages of honour, 17 to 20; as university students who have passed specified examinations, 17 to 21; as university graduates, or as students of colonial universities, 17 to 22. Competitors (not being university candidates) who desire to obtain commissions in West India regiments may be admitted up to 24. The examinations are conducted in July and December by the Civil Service Commissioners; admission fee, 1*l.* The college is under the control of a governor, who is assisted by an officer styled commandant and secretary. The governor is assisted in the arrangement of the studies by a board composed of the commandant and the professors or senior instructors of the different branches. The course of instruction is one year; and the obligatory subjects of study are military administration, military law, the elements of tactics, fortification, military topography, and drill, riding, and gymnastics. Cadets on admission receive first appointments as sub-lieutenants, and on passing a satisfactory examination at the end of the college course become entitled to commissions in the army as second lieutenants, and may be gazetted to regiments in the order in which they pass. After a year with his regiment, the officer is confirmed in the army as lieutenant. Commissions in the army may also be granted to officers of the auxiliary forces on due recommendation of their general officer commanding, and to subalterns of militia regiments (artillery, engineers, or infantry), as the result of a competitive examination conducted (*a*) in literary subjects (April and October, admission fee, 1*l.*) by the Civil Service Commissioners, and (*b*) in military subjects (March and September) under direction of the Director-General of Military Education (age under 22 on January 1 preceding). The number of army commissions to be allotted to the successful competitors at each of the half-yearly competitive examinations is seventy-five. (2) The Royal Military Academy, Woolwich, was established in 1741. It affords a preparatory education to candidates for the Royal Artillery and Royal Engineers—an education chiefly technical, and not carried in any obligatory subject beyond the point useful to both corps alike. Admission as cadets is granted to the successful candidates at an open competitive examination conducted by the Civil Service Commissioners in December and July each year. The limits of age are 16 to 18. The governor is a military man, selected with special reference to his qualifications for superintending both instruction and discipline; and he is assisted in the arrangement of the studies by an academy board, composed of the professors or senior instructors of the different branches. The course of instruction occupies two years. The obligatory subjects are: mathematics, including a thorough knowledge of plane

trigonometry; practical mechanics, with the application of mathematics to machinery; fortification, field and permanent—such a course as is suitable to cadets qualifying for the artillery—and the requisite amount of geometrical drawing; artillery—such a course as is suitable to cadets qualifying for the engineers; military drawing, with field sketching and reconnaissance, military history and geography; French or German (at the student's choice); elementary chemistry and physics; drills and exercises. In addition to the obligatory course, every cadet is allowed, at his option, to take up certain voluntary subjects—higher mathematics; higher portions of fortification; any of the following languages: German or French, Italian, Russian, Spanish, or Hindustani; freehand, figure, and landscape drawing; higher chemistry; Latin and Greek (instruction in which languages is given by the chaplain). Commissions as lieutenants in the Royal Artillery or Royal Engineers are conferred on such cadets as pass satisfactorily the final examinations prescribed.

II. Schools for the advanced professional instruction of officers. (1) The Staff College, Farnborough Station, about two miles from Sandhurst, was established in 1858. It is open to officers of all arms of the service, and may consist of sixty students (including, as supernumeraries, eight officers of the Indian Army and Royal Marines). Admission is obtained by competitive examination in mathematics, military history and geography, fortification, military topography, tactics, military law, French, German, and Hindustani; every candidate being required to qualify in mathematics, languages (French or German, except for officers of the Indian Staff Corps, who may substitute Hindustani), fortification (field and permanent), military topography, and tactics. The examination for admission in February takes place each year in the preceding June; it is conducted by boards consisting, wherever possible, of three field-officers. Only one officer from a line battalion of infantry or regiment of cavalry, and twelve officers from the Royal Artillery and Royal Engineers, belong to the college at one time. Each year twenty-four vacancies are offered for competition. They are filled as follows: three by officers of the Royal Artillery, two by officers of the Royal Engineers (with an additional vacancy per annum for each corps alternately, provided they are among the twenty-four candidates highest on the list), and eighteen by officers of the remaining arms of the service. In addition to these the Commander-in-Chief may nominate annually for entrance to the college two officers who have performed good service in the field or held the appointment of adjutant with the regular forces for a period of four years; and these officers are required only to reach the qualifying standard in the examination. No officer will be permitted to compete for admission whose age exceeds thirty-seven years at the date fixed for the examination. The commandant, in arranging the details of the course of instruction, is assisted by a board of professors, military and civil. The course occupies two years, and the subjects are: military art and history, fortification and artillery, field fortification, military administration and staff duties, military topography, reconnaissance and other practical field-work, military law, modern languages, natural sciences, and riding. After leaving the college, officers are ordered to report themselves at Aldershot on April 15, to be attached as follows: Cavalry officers to infantry for two months, artillery two months; artillery officers to cavalry for two months, infantry two months; engineer officers to cavalry for two months, artillery one month, infantry one month; and infantry officers to cavalry for two months, artillery two months. During these periods they are regularly attached for duty to the several branches of the service indicated, are required to perform the regimental duties, and perform such services on the staff as will ensure their being practically conversant with the various duties of those branches. (2) The Department of Artillery Studies acts in continuation of the Woolwich training of artillery officers, and qualifies specially for appointments that demand exceptional scientific attainments. (3) The School of Military Engineering at Chatham gives special training to officers of the Royal Engineers after leaving Woolwich, in construction, surveying, field fortification, telegraphy, &c. (4) Garrison Instructors are staff officers, with the rank of brigade-major, appointed to all the principal garrisons and military stations at home and abroad, to instruct officers serving with their regiments, and to enable them to

qualify in the special examinations for promotion. The subjects are: tactics, field fortification, military sketching and reconnaissance, and law. The course lasts during four months, and those candidates who pass a successful examination at the end of it are certified as qualified for promotion.

III. Schools of professional training open to both officers and men. (1) The School of Gunnery at Shoeburyness provides for officers and men of the artillery a thorough course of practical instruction in gunnery, use of military machines, &c.; and it qualifies instructors to brigades and batteries. (2) The School of Musketry at Hythe receives periodical contingents of officers and men from all regiments in the service for special training in the theory and practice of musketry, officers and non-commissioned officers being qualified to act as musketry-instructors to their regiments.

IV. Miscellaneous. (1) The Army Medical School at Netley, in connection with the great military hospital, receives candidates for appointments as surgeons for a probationary course. (2) The Military School of Music at Kneller Hall, Hounslow, was established in 1857. It instructs non-commissioned officers and soldiers (148) in music, and trains bandmasters and musicians for the various regiments. The period of training is two years. (3) The Royal Military Asylum at Chelsea—also called the Duke of York's School—and the Royal Hibernian Military School at Dublin, maintain and educate a limited number of boys, sons of soldiers, who are admitted between the ages of five and twelve, and may remain till fourteen (and if of the band, till fifteen). The Royal Military Asylum is also a normal school for training army schoolmasters, admission being by competitive examination, open to non-commissioned officers and soldiers of the army who are of good character and are specially recommended, to civilian pupil-teachers, and to certificated schoolmasters. (4) Army Schools (adult grown, children, infant, and industrial) are established in every regiment and detachment, for non-commissioned officers and soldiers and their children. Raw recruits are required to attend, and soldiers are not eligible for promotion until they have obtained certificates of proficiency. Candidates for the post of army schoolmaster go through a prescribed course of training at the Royal Military Asylum, Chelsea. They must enlist for general service for twelve years before appointment. They rank as non-commissioned officers next to sergeant-major, and receive 4*s*., rising to 7*s*., a day. Schoolmistresses (three classes) receive 30*l*. to 44*l*. a year.

Education Department.—The Education Department, the offices of which are situated at Whitehall, is under the control of the Committee of Council on Education, that is to say, the Committee of the Lords of the Privy Council. Practically, however, the Department is controlled by the Vice-President of the Council, who may be regarded as the Minister of Education, though he is without Cabinet rank. The Department was formed in 1839 and in 1856 was reconstituted by an Order in Council to include: (*a*) the Education Establishment of the Privy Council Office; (*b*) the Establishment for the Encouragement of Science and Art, previously under the direction of the Board of Trade, but now called the Department of Science and Art. The Department has the control of the whole public elementary education system of the country, and of the system of technical education connected with the Science and Art Department (*q.v.*). A report of the results of its administration is annually published. (*See* CODE and SCHOOL BOARDS.)

Education for the Navy.—Naval education may be considered under two heads: (1) the education of the officers, and (2) the education of the men.

(1) The officers are selected by competitive examination from lads about thirteen years of age, nominated by the Lords of the Admiralty. This examination is conducted by the Civil Service Commissioners, and embraces the ordinary subjects taught at our great public schools, with the exception of Greek. The successful candidates spend two years as 'cadets' on the 'Britannia' at Dartmouth, in which time they obtain a fair knowledge of the elements of navigation, nautical astronomy, steam and physics, besides continuing their former studies.—They pass the next four years at sea as 'midshipmen,' and the instruction is continued by a naval instructor. Their progress in their studies is tested by half-yearly examination papers sent from Greenwich. The value of the work done in these four years depends very much upon the interest taken by the captain of the ship, as well as

by the naval instructor. At the age of nineteen they go to the Naval College at Greenwich. They are now 'acting sub-lieutenants,' and six months are allowed for preparation for the final examination for sub-lieutenant. This examination embraces algebra, trigonometry, geometry, mechanics, physics, steam engine, French, winds and currents, navigation, nautical astronomy, nautical surveying, use of instruments, and astronomical observations.—Most of the officers succeed in passing, and are divided into three classes. But those who do not obtain half the total marks given 'fail to pass,' and they cease to belong to the Royal Navy. Fortunately, such cases seldom occur. Another half-year is devoted at Portsmouth to torpedo practice, gunnery, and pilotage. The education of the greater part of the officers then ends. But those who have excelled in the above-mentioned studies usually spend another session at the Naval College, Greenwich, as torpedo and gunnery lieutenants, in acquiring a knowledge of more advanced mathematics, chemistry, and physics. In 1886 a committee reported on the education of naval 'executive officers,' and recommended that the age on entry should be raised to fourteen years, besides many alterations in the course of instruction.

(2) There are five training-ships for boys—'Boscawen' at Portland, 'Ganges' at Falmouth, 'Impregnable' and 'Lion' at Devonport, and 'St. Vincent' at Portsmouth. To these ships boys above the age of fifteen and a half years are admitted after passing a medical examination, and a simple examination in reading, writing, and arithmetic. Their educational attainments on admission vary very much, and the education they receive on board is similar to that given at Board Schools. Periodical examinations are held by the Inspector of Naval Schools. In some of the large sea-going ships there are seamen schoolmasters; but as the boys cease their compulsory studies on being rated as ordinary seamen between the ages of eighteen and twenty, these teachers have little to do. There is also a nursery for the navy—the Greenwich Hospital School. Here nine hundred sons of seamen are educated from the age of eleven to fifteen and a half years. At that age, if physically fit, they must go into the Royal Navy. As their scholastic attainments are much higher than those of the other boys admitted to the training ships, and as they have already been trained in seamanship, these boys generally make the most efficient sailors.

Education of Boys. *See* Boys.

Education of Deaf Mutes.—The education of congenital deaf mutes or of those who have acquired this infirmity after birth simply consists in assisting nature. By means of his eyes and his other healthy organs of sense, a deaf mute child becomes familiar with the objects around him, with their nature, and the purposes which they serve. He watches the daily occupation of his friends, and imitates them by instinct. Besides that, as the child learns to describe the objects around him by gestures, a kind of intercourse, although it may be only very limited, is established between him and his friends. The child also learns to make use of his innate faculty of expressing his sentiments. The development of the inherent faculties of the child must be aided by training. His attention must be drawn to the objects around him, their purposes explained by signs, and in this manner the intercourse carried on by gesture made as instructive as possible. The deaf mute child is exceedingly quick in describing objects by simple gestures. In all such attempts he should be aided by his friends, who should endeavour to understand, and to answer them. Instruction gained thus may be said to be gained by the use of two kinds of signs: descriptive and indicative. Descriptive signs involve an account, more or less complete, of the appearance, qualities, and uses of an object, or the circumstances of an event, for the purpose of description or explanation; while indicative signs, which are employed in common conversation, are usually mere abbreviations of these, involving a striking feature of the person, or object, or event, as an elephant is indicated by its trunk, a flower by its fragrance, or a town by a collection of roofs. It is obvious that in this latter class of signs there is great room for dialects, according to the situation, capacity, and habits of observation of the individual, and that much may be done for its improvement by a proper selection. The method of instruction in schools, most commonly adopted in England, consists in teaching the pupil the relation between the names of objects and the objects them-

selves, the analysis of words into the letters of the alphabet, and the particular gesture belonging to each word as its distinctive sign. Next are explained general terms and genuine names, and finally abstract terms, such as object, being. The child must be made conversant with the qualities expressive of the accidents, variations, and modifications of objects, which are expressed by the adjective. The meanings of words cannot be too clearly understood, and the ideas the words express. Thus, the first thing to begin with is the explanation of the names of external objects best known to the pupil, preferring always those of few letters—such as box, pen, shoe, cap, hoop, ring; and then gradually longer and more difficult words. The pupil should be taught to copy the words himself, and perhaps to draw the objects, so that by dwelling upon the forms sufficiently, the forms may make an indelible impression on his mind. The pupil should next be taught the use of the verb, the pronoun, and the several parts of speech, and the structure of the sentence generally. As soon as the pupil is made familiar with the use of letters, and can spell words with some degree of accuracy, it will be advantageous to instruct him in *dactylology*, or the manual alphabet as it is sometimes called. This method of communication is an art easily acquired and retained, or recovered if lost, and it furnishes a ready substitute for pen or pencil. The extent, however, to which the deaf mute can communicate will depend entirely upon the state of his education, or upon his knowledge of language. When properly instructed he will converse with the utmost rapidity by this method; habit enables him to follow with the eye motions which to others would be too rapid for observation. He can readily catch at the meaning of a word or question before it is half spelt. It should be added that this method is two-fold—the double-handed alphabet, where the letters are expressed by the dispositions of the fingers of both hands, and the single-handed, in which the letters are formed with the fingers of one hand. It is supposed that the former was derived from a finger alphabet which appeared in a work of Dalgarno; and the latter is said to have been invented in Spain, and appears to have been published in a work by Bonet, to which the Abbé de l'Épée was much indebted in his valuable treatise. The pupil may also be taught to communicate his thoughts by moving his lips, and to understand what is spoken by others by observing the motions of their lips. This method, although not attended with very great difficulty, is laborious and tedious, and requires always patience and perseverance to ensure success. It is fully expounded in Dr. Joseph Watson's standard work on the *Instruction of the Deaf and Dumb* (London, 1809). Another method is by means of articulation. This method claims some respect for its antiquity. The Venerable Bede, e.g., in his *Ecclesiastical History* mentions the case of a man being so taught by the Bishop of Hexham in 685. Articulation is taught by pointing out to the pupil the powers of the vowels and consonants, and the position of the lips, teeth, and tongue, and by making him feel with his hand, or a silver instrument, all the perceptible movements and vibrations of the throat and interior organs which are requisite for their pronunciation. He is then required to imitate this position, and to force a quantity of air from the lungs sufficient to produce the sound, and is taught to read the articulations of others, by observing the position of the organs and the countenance. As such utterance is not regulated by the ear of the speaker, it is often too loud, monotonous, harsh, and discordant. It is on that account sometimes difficult for a stranger to understand a speaker. The education of the deaf mute usually begins at the age of six or seven. Day schools, where practicable, are in many ways preferable to asylums. In the latter there is a tendency to bring the deaf and dumb too much, or exclusively together. Professor Owen, in 1862, 'especially referred as a physiologist to the lamentable results' of deaf mute intermarriages which are promoted by those asylums; 'and strongly advocates a social system of education.'

Education of Girls.—'The ideal presented to a young girl,' says an able writer (Miss Davies, *Secondary Instruction of Girls*, p. 15), 'is to be amiable, inoffensive, always ready to give pleasure and to be pleased.' The statement may be exaggerated, but that the feeling it describes will ever cease to be extremely prevalent can hardly be expected. Parents are indifferent to the education of their girls; it leads to a less immediate and tangible pecuniary result, and there is a long-esta-

blished and inveterate prejudice that girls are less capable of mental cultivation, and less in need of it, than boys. Partly owing to that fact, and partly owing to the smallness of schools and the inaptness of teachers to teach, there are in the education of girls a want of thoroughness and foundation, a want of system, a slovenliness and showy superficiality, inattention to rudiments, undue time given to accomplishments, and those not taught intelligently or in any scientific manner, and want of organisation (cf. *Report of Schools Inquiry Commission; Parl. Pap.*, 1867–68, xxviii. pt. 1, pp. 546–70). The time devoted to subjects is badly distributed. Needlework, e.g., occupies too much time; it is capable of being more taught at home, and the kind of it which most prevails consists too much of an ornamental character. Music, especially the pianoforte, should be modified in its use, and made to include far more of the elements of thoroughbass. The important subject of bodily exercise seems to be still imperfectly attended to. Though undoubtedly under the name of calisthenics (*q.v.*) it is duly encouraged in the better schools, yet there is a great want of systematic and well-directed physical education which often causes failure in health and an impediment to successful study. Much that has been said above as to the education of boys (*q.v.*) applies equally to the education of girls. The essential capacity for learning is the same, or nearly the same, in the two sexes. This is the universal and undoubted belief throughout the United States, and it is affirmed, both generally and in respect to several of the most crucial subjects, by many of our best authorities. There are no doubt many differences in degree in the sexes, such as the tendency to abstract principles in boys, contrasted with the greater readiness to lay hold of facts in girls; the greater quickness to acquire in the latter, with the greater retentiveness in the former; the greater eagerness of girls to learn, their acuter susceptibility to praise and blame, and their lesser inductive faculty. But generally we may say that the foundation, the main and leading elements of instruction, should be the same in the two cases, and, further, that ample facilities and encouragement, far more than now exist, should be given to women who may be able and willing to prosecute their studies to a higher point. Up to the age of twelve girls hold their own in the ordinary subjects of instruction with boys, and it is now generally recommended that the education of boys and girls should be alike up to the time when the special vocations which the respective pupils intend to pursue necessitate a divergence. Without such an education it is impossible for women to fill those new vocations in life not hitherto pursued by them and now opening up to them. On this subject not much can yet be said with confidence. Even in America it cannot be said to have made much progress, and in this country it is spoken of as still uncertain and tentative.

History of the Movement: It would be rather difficult to trace precisely the first stirrings in public opinion on behalf both of a better and cheaper form of instruction for girls. The first definite movement for the higher education of women may be traced, perhaps, to the foundation of the Governesses' Benevolent Institution in 1843. Since there were no day schools except for the poor, the middle class had no alternative between engaging a daily or resident governess, and sending their children to a boarding school. Many families could give only small salaries, and large numbers of the great army of family governesses were, in sickness and in old age, left in abject poverty. The tradition which prevents the society from giving any help to teachers in day-schools is a survival from the time when only the very poor went to day-schools. When a registry was opened by the society, it was found almost impossible to distinguish real governesses from mere pretenders. There was absolutely no test of qualification. The society's annual report for 1845 speaks of the 'anxiety of the committee to exclude unqualified teachers from the profession, and gradually to raise the tone of female education.' It adds, 'difficulties, which the committee had not anticipated, have arisen with the several authorities from whom boards of examiners, with power to grant a diploma of qualification, might originate. Recent events may open a better hope.'

In the report for 1846 things are scarcely advanced. To those who can read between the lines, the following sentences speak of efforts to found a college and to get an examining board

recognised, and of the opposition of some subscribers, whose idea of charity was the giving of money. 'Arrangements for a diploma are still subjects of consideration. The committee were not prepared to find the higher authorities of the country unawakened to the importance of female education in its bearing upon national character, and thus upon national prosperity; nor to find that those legislative favours, which have been lavished so freely upon the endowed schools and universities for the one sex, should be withheld from the first effort ever made to place female education upon a proper basis.' In the report for 1847 we read, 'The college has commenced its operations this year: Her Majesty the Queen has permitted the use of the Royal name.' Some of the professors of King's College, amongst whom F. D. Maurice took the lead, had, in October 1847, formed an examining body, and begun to examine and grant certificates to governesses without payment, and early in 1848 a series of opening lectures were given, which were afterwards published in a volume, and helped much to modify public opinion; classes were immediately after formed. In the report for 1848 we read, 'Queen's College has opened its doors; there are two-hundred entries.' Some of the first teachers were Frederick Denison Maurice, his brother-in-law, E. Hayes Plumptre (now Dean of Wells), Richard Chenevix Trench (afterwards Archbishop of Dublin), Brewer the historian, and other leading men. Mr. Llewellyn Davies has rightly called the establishment of Queen's College an epoch in female education. Lady Stanley of Alderley, Lady Monteagle, and many others became lady visitors. The Queen founded scholarships. The professors kindly opened free evening lectures for ladies engaged in teaching. Miss Buss writes, 'Queen's College opened a new life to me intellectually; to come in contact with the minds of such men was a new experience to me and most women. I was a member of the evening lectures at the outset.' It is strange from the vantage ground of the present to read the apologetic tone of these early papers; and the prophecy of the founders of Queen's College has indeed been fulfilled. They write, 'When the whole class look back at some future time upon the operations of the society, the committee are sanguine that this will be the branch from which has resulted the largest amount of permanent and general advantage.' A simultaneous movement was begun by teachers themselves.

In 1845 the College of Preceptors (*q.v.*) was formed; it was at first rather a benefit society: then the necessity arose for testing the qualifications of those who had no university degree, and so examinations were opened for men and women alike.

The success of Queen's College led to the establishment in 1849 of Bedford College upon an undenominational basis —upon the lines of University College, as opposed to King's. Mrs. Reid contributed largely. Francis Newman, De Morgan, Dr. Carpenter, were amongst its first teachers. Erasmus Darwin, Thomas Farrer, and Hensleigh Wedgwood became trustees; Miss Jane Martineau was secretary. Subsequently Miss Buss, who, with her mother, had been carrying on a private school, determined to develop it on the lines of a public school. She placed it under the enlightened supervision of the Rev. David Laing (who had been the prime mover in the establishment of Queen's College), and removed it to Camden Town.

In 1853 the Cheltenham Ladies' College, the first proprietary school for girls, was established by some gentlemen connected with the Cheltenham College.

Some good private schools were opened, but it was more than ten years from this time ere any great public movement was made. Then some ladies, under the leadership of Miss Emily Davies, pressed upon the Schools' Enquiry Commission, 1863–1868 (*see* ROYAL COMMISSIONS), to get, if possible, some insight into the girls' schools above the elementary. Miss Davies, Miss Buss, Miss Smith, Miss Wolstenholme, Miss Beale, and other ladies gave evidence before the Commission; the chief portions of the Report on Girls' Schools were afterwards reprinted by Miss Beale. The evidence collected made a great impression, especially on Mrs. Grey and Miss Shirreff. They began an active missionary agitation for improving the education of women. Cambridge had for ten years held local examinations for boys. Miss Emily Davies and the ladies acting with her prevailed on the University to allow

girls (1865) to take informally the papers set for boys. Many evils were predicted, but after two years' experience, girls were in 1867 regularly admitted. In 1869 a special women's higher examination was also instituted; and Miss Davies, desiring to obtain for women the highest education, established at Hitchin, within easy reach of Cambridge, a college for women, in which the course of study and examinations was made as nearly as possible identical with those of the University.

The London University, 1869, opened a special examination for women; it was almost identical with the matriculation. Very few came forward. In nine years only one hundred and thirty-nine passed; more than half of these were pupils from two schools—forty-four were from the Cheltenham Ladies' College, twenty-eight were from the North London Schools founded by Miss Buss; the first to take a certificate in mathematics was from Cheltenham.

In 1870 Josiah Mason, by a deed of foundation, gave to Birmingham a Science College, open to men and women, and University College, London, opened its classes also to women. Only three entered; there are now two hundred and twenty on the books. In 1871 Mrs. William Grey, and her sister Miss Shirreff, founded the National Union for Improving the Education of Women; this accomplished a great work by organising effort, helping 'to create a sounder public opinion with regard to education itself, and the national importance of the education of women, and thus to remove the great hindrance to its improvement, the indifference with which it is regarded by the public.'

Mrs. Grey and Miss Shirreff paid a visit to the North London Collegiate School for Girls. Miss Shirreff also spent some days at Cheltenham, and they decided that large and efficient girls schools ought to be opened at once, not on an eleemosynary, but on a commercial basis. Meanwhile opportunities for obtaining higher education were extended. A University College was opened at Aberystwith, where education was offered on equal terms to men and women. Subsequently similar colleges were added at Cardiff and Bangor. The small Women's College at Hitchin was removed to Girton.

In 1872, Miss Buss, giving up her private property in her school, now consisting of two hundred girls, with public-spirited generosity, made it a *Public* School by placing it in trust. A lower school was also established in Camden Town under the same management. Meanwhile ladies' associations were formed in various large towns, and a very important movement began. Lecturers chosen by Cambridge were sent to give courses of systematic instruction. The Girls' Public Day School Company was founded in 1873, and the following year the Fröbel Society. A joint board was formed to examine schools of the rank of Boys' Public Schools.

Girton had rather insisted on the importance of conforming its course and examinations to those instituted for men; but many women desired university culture—without being prepared to go through the regular studies, which were familiar to boys, but difficult for those who had taken other lines. To meet their wishes, Merton Hall was opened, 1871, by Miss Clough (sister of the poet), who was full of devotion to the cause, and spared neither her own labour nor her money. It slowly increased, until, some years later, it was removed to Newnham.

Only one other important college for women had been founded since the beginning of this movement. A college, afterwards called Alexandra College, Dublin, had been established in 1866 by the energy of Mrs. Jellicoe, supported as she was by Archbishop Trench and the Provost and Fellows of Trinity College; but every year new endowed or proprietary schools for girls were opened, and in 1874 the Head Mistresses' Association held their first meeting at Miss Buss's house. Existing colleges continued to grow. The Ladies' College at Cheltenham, once a school, had grown into a college, and in 1873, twenty years after its foundation, it was removed from a private house into a beautiful college designed for two hundred and fifty pupils. In 1874 Bedford College collected 8,000*l.*, and moved to York Place. Miss Buss's long labours seemed crowned with success, when, in 1875, an endowment of 20,000*l.* was assigned to the Camden schools by the Charity Commissioners; the Clothworkers added 3,000*l.* in 1878. Miss Ewart had already, in 1872, given 1,000*l.* to the Lower School. In 1879 the handsome buildings of the North London Collegiate

School were opened by the Prince of Wales, and it has ever since had large numbers on the books waiting for entrance. Mrs. Bryant, D.Sc., a lady of exceptional talent, and distinguished equally in mathematics and mental science, became the able vice-principal. Meanwhile a most important movement had been going on. In 1858, Dr. Elizabeth Blackwell had taken her M.D. in Switzerland. Soon after, Miss Garrett began to seek medical education in London. In 1866 she became a qualified practitioner, and then began a desperate struggle on the part of the less enlightened of the profession to shut the door against women. It culminated in 1873 when the women students of medicine were driven from Edinburgh to London. In 1874 a women's medical college was opened in London. In 1876, Mr. Russell Gurney's Enabling Act opened qualified medical examinations to women, and several who had Swiss degrees immediately took degrees in Dublin.

Meanwhile the University Extension movement was prospering. Professors from the Scotch Universities and Cambridge delivered many courses of lectures, and undertook the correction and criticism of students' papers. The London Society promoted the movement, and Oxford joined. St. Andrews opened a higher examination for women, and granted the degree of LL.A. In this year a women's hall was opened at the University College of South Wales. A still more important move was taken next, in 1877, namely, the establishment of Training Colleges for teachers in High schools. Miss Newman (sister of Mr. William Newman, the distinguished fellow of Balliol and recent editor of Aristotle) opened a small house, in connection with the Cheltenham Ladies' College, for students unable to pay high fees. At her death money was collected, and the College of St. Hilda's, Cheltenham, for students over eighteen, was afterwards built. The following year, 1878, the Maria Grey Training College was established in London. This year King's College again took the lead in a great movement for the extension of women's education. Dr. Barry, then Principal, opened classes for ladies in Kensington. There were at once over two hundred entries. In six years the number had doubled; then the College authorities took a house in Kensington Square, and the Women's Department became an integral part of King's College. The year 1879 was a memorable one in many ways; the London University, having given up its cry of *non possumus*, had obtained a supplemental charter, and in January for the first time admitted women on the same terms as men. Oxford, meanwhile, had displayed its conservative tendencies. Whilst Cambridge was ever offering fresh advantages to women and London was giving degrees, Oxford reluctantly opened its local examinations, and ten years after the Hitchin College had been opened, ten years after the London University had examined women, the Ladies' Association was formed in Oxford, and two Colleges were founded, Somerville and Lady Margaret. The same year the first brick was laid of the magnificent edifice, Holloway College, which, to those who remember the early phases of the women's educational movement, seems an Aladdin's palace. In 1880 Owens College, Manchester (founded 1852), became the Victoria University, and received power 'to bestow degrees on all persons, male and female, who shall have pursued a regular course of study in a University College, and shall submit themselves for examination.' The Liverpool and the Yorkshire College (at Leeds) now form part of the Victoria University. In 1882 the London University granted medical degrees to two women, and the Cambridge Tripos examination was opened to women. After a desperate fight at Oxford the Honours examination was also opened. But still, in 1889, degrees for women must be sought in London, Manchester, Ireland or elsewhere. Meanwhile, there had been growing up all over the country large and efficient schools for girls; those of the Girls' Public Day School Company, some specially Church schools, and many independent ones on proprietary lines; also the endowments which had been diverted to boys alone, were now being restored to girls, and a number of old foundations were revived. Some of the most important were, the Bluecoat, the Greycoat, Westminster, the Bedford, the Aske and Mary Datchelor Schools. In 1883 the Church School Company was founded on the lines of the Girls' Public Day School Company.

Another movement began, the import-

ance of which can hardly yet be estimated. The idea originated with Miss Buss, of uniting into one great body all teachers, whether men or women, and forming thus a body of such weight and importance that its voice must be heard. Miss Hadland, the able head of Milton Mount College, added to her labours the work of honorary secretary, and the Teachers' Guild (*q.v.*) was started. It was incorporated two years later, 1885. It has now nineteen branches, and over three thousand members.

In 1884 Miss Prideaux, in the final examinations of the M.B. and B.Sc. London, obtained distinguished honours – Class I. in Medicine, 6th in honours ; Class II. in Obstetrics, 3rd in honours ; Class II. Forensic Medicine, 2nd ; Class III. Surgery, 1st. She died the following year of diphtheria caught in the discharge of her duties. The beauty of her character helped to break down the remaining prejudices felt against women doctors ; the last vestiges disappeared when the sufferings of Indian women were brought before the English community by the Marchioness of Dufferin, and a national association was formed to supply female medical aid.

By the help of large endowments and a great system of scholarships and prizes, women's education was also progressing in Ireland. In 1885 the Princess of Wales took the degree of Doctor of Music, and the grace with which she wore the robes appropriate to the degree, and her expressed desire thus to mark the royal approbation of the movement, tended materially to remove existing prejudices. The Marquis of Abercorn in a speech on that occasion said : 'All our examinations (*i.e.* of the Royal University of Ireland) are open to women on the same conditions as men. Several of our highest distinctions, including mathematics and literary scholarships and degrees in arts and honours, have been carried off by women.' The following year Alexandra College was incorporated under the Educational Endowments Act.

Subsequently Girton acquired a legacy of 20,000*l.* ; a women's hall was opened in connection with the University of South Wales ; King's College took possession of the new buildings at Kensington ; Somerville Hall was enlarged ; the Scotch Universities obtained an act enabling them to grant degrees to women ; a definite women's department in connection with the Victoria University was established ; andOwens College, now in association with the Liverpool and York Colleges called the Victoria University, gave the B.A. degree to four women. The Jubilee year was signalised by the opening of the magnificent Holloway College, under the management of Miss Bishop, the able head-mistress of the Oxford High School. At Cambridge women won special distinction, Miss Ramsay being senior classic, and having the whole class to herself, Miss Harvey occupying a similar position in the Mediæval Languages Tripos. A third hall was opened at Cambridge by the Prince of Wales in 1888. Oxford opened the Honour School in Lit. Human. Women gained special distinctions this year in the examinations of the London University, Miss Worley having taken the Gold Medal, being the highest in Classics at the Final M.A. In the B.A. Classical Honours Miss Richardson of Cheltenham was bracketed equal second. In medical education the most important incident was the admission of Dr. Sophia Jex-Blake to examination by a joint committee of the Edinburgh Colleges of Physicians and Surgeons, and the granting her a qualification as Extra-Mural Lecturer on Midwifery. This is the first instance of the official recognition of a woman as lecturer in a public medical school in this country, and it is of particular significance as representing the progress of opinion in Scotland, where it will be remembered with how much difficulty the lady students, excluded from the University, obtained their education in the Extra-Mural School of Edinburgh. In Psychological research also Miss Waterton, M.D., competed in the Psychological Society's examination, and won a certificate in the examination for mental diseases.

Another step towards breaking down the intellectual barriers which separated men and women was taken in the summer meeting for Extension Students at Oxford in 1888. The number of tickets was limited to about 1000. Far more could have been sold, and from all parts came men and women, brothers and sisters, fathers and daughters, heads of schools, teachers and senior pupils, working men and people of high position, social and intellectual. The large rooms in the new

schools were crowded every morning with eager listeners—afternoon and evening lectures were also given. Meetings were held for the discussion of educational subjects, and a great stimulus was given to University Extension work. Schemes were discussed for bringing the University into still closer relations with students in large towns, by the forming of reading circles, the granting of certificates, &c.

To sum up the results of the last forty-five years:—At the beginning of the period passed in review there were no day-schools for girls above the elementary. There are now about 120 large day schools, and at least 20,000 girls in attendance. The Girls' Public Day School Company has 33 schools and nearly 7,000 pupils. The Church Schools Company has 22 schools and over 1,600 pupils. There are about 40 endowed schools opened. The North London Collegiate School and the Bedford High School number about 500 pupils each, and some independent schools, as the Manchester High School and the Cheltenham Ladies' College, about 700 each. Still, however, there is much to be done. The existing number of High Schools and Colleges is still far from adequate. There was until forty years ago no college where women could receive anything corresponding with a university education. Now there are twelve large and important colleges in London, Cambridge, Oxford, Edinburgh, Dublin, Glasgow, Egham, and Cheltenham; and nearly as many colleges in which men and women study on equal terms in London, Manchester, Bristol, Liverpool, Bangor, Aberystwith, and Cardiff. There were then no examinations open to girls or women; now all the Universities admit boys and girls to the local examinations on the same conditions, and the Oxford and Cambridge Schools' Examination Board grant certificates to both. Degrees are given by the London and Victoria Universities, and the Royal University of Ireland. Women are admitted to the Tripos and Honour Examinations at Oxford and Cambridge, though they have no degree. At Cambridge 319 women, at Oxford 52, have passed Final Examinations. In London over 200 have taken their degree; 172 the B.A., 24 the B.Sc., 8 the M.A., 6 the M.B., 2 the M.D., 2 the D.Sc., 1 the LL.B. The respectful treatment they meet with at Burlington House when degrees are given, contrasts strangely with the treatment they experienced in Edinburgh fifteen years ago. There are now medical schools for women in London, Edinburgh, and Dublin, to say nothing of India. About 80 women have taken medical diplomas. Women hold positions as physicians and medical officers in seven hospitals for women and children in England, and in five in India, and no hospital is without its highly educated sisters and thoroughly well-taught, trained nurses. Schools of music and art are everywhere open to women, and they have attained great success in literature

No school now is left to work in isolation, in none are the pupils without a test that they have learned something. The Cambridge Local Syndicate examinations, which were first opened to boys in 1858, and ten years after extended to girls, examined in 1887 about 10,000. The candidates in the Higher Local (originally for women alone, but now open also to men) numbered 36 in 1869; in the twentieth year after, about 1,000 presented themselves, of whom nearly all were women. The Oxford Delegacy examined in 1887 about 2,904, of whom 1,288 were girls; but the number examined is largely increased by the sending in of whole schools for a combined inspectional and local examination. The College of Preceptors examined about 15,000. Many University lectures are now open to women. University Extension lectures, attended equally by men and women, are given in most large towns. In 1887 Cambridge alone arranged 100 courses in 56 towns, and the entries were over 10,000. In the same year eight towns were more closely affiliated to the University, and students who attend a certain number of courses, write papers, and undergo a certain number of periodical examinations, are considered to have resided one year at the University.

Thus education of the best and highest kind in all departments is now open to girls and women. They have the opportunity of proving their capacity, and lucrative appointments are to be had. The Girls' Public Day School Company alone pays about 63,000*l.* a year to women teachers. The aggregate salaries paid to women teachers in public schools and colleges cannot, we think, be much under 200,000*l.* a year. Had the Governesses' Benevolent Institution restricted themselves to making

charitable doles, and the founders of the Women's Union decided to beg rather than work for their money, the wonderful success attained in fifteen years since the Chelsea High School was opened would scarcely have been attained in a century. The chief leaders in this great movement, Miss Buss, Miss Shirreff, Mrs. Grey, and Miss Emily Davies, survive to look on a world changed more than could at the beginning have been conceived possible. All has been done quietly, gradually, patiently. The old idea of a 'lady' being one who came to be ministered unto, is gone. To render service is felt to be the highest privilege. The desire to serve has made women contend for the means of education and training. This passion for service, as Ruskin has taught, stimulates every faculty, glorifies and gives insight into nature, and hallows all art. This, as our great musicians have shown, ennobles the emotional nature and exalts its expression. As women came to feel more and more that culture is good for the human being, cultivated women longed to lift up those who had not their advantages to a higher level; thus the many unmarried became working bees in the social hive. Everywhere ladies have been found working for the better education of the poor, ready to leave a home of comfort and even of luxury, some to become national school mistresses, some to minister to the poor in hospitals and workhouses, in prisons, penitentiaries, in asylums for the insane, &c., and in the homes of the sick poor. Women sit on the School Boards; they have been elected Guardians of the Poor and County Councillors, and one lady (Miss Cons) has been chosen as an Alderman for the County of London. There are about sixty different Orders of Sisters or Deaconesses engaged in a vast variety of religious, philanthropic, educational, and charitable work. Organisations consisting of many thousands have been formed and managed by women, to help those who are working for bread, notably the G.F.S, the M.A.B.Y.S., the C.Y.W.A., the Y.W.H.S., the Girls' Club Union, and the College for Working Women. The Oxford and Cambridge colleges have both tried to do some work on these lines, and have established settlements of their own in the poor parts of London. Many outcasts, too, have been gathered in by the Church Penitentiary and similar societies, and women have been leaders in the great crusade against the most terrible evils which afflict humanity. Women entirely manage the Zenana mission, and take an active part in foreign home missions as accredited agents of the great societies. They have become lecturers and writers on social topics, forming societies for emigration, for sanitary science, and giving lectures on temperance, dress, cooking, home arts and industries, plain and art needlework, Slöjd, &c. Some take up lecturing as a profession, and are employed by the Palestine and Egyptian Exploration societies. Miss Harrison lectures at the British Museum on Greek Art. Others have taken up physical culture, treating it as a matter of national importance. The old prejudice that for a woman to earn money was to lose caste is almost a thing of the past. Those who are admitted to the highest circles of society have accepted headships of women's colleges; head mistresses take rank with head masters. Lady physicians and other professional women now take the place to which they are entitled. Women medical officers have even been appointed to the Government service, and it is not thought unwomanly to lecture and address large audiences. Women are carrying on business as printers, lithographers, law-copyists, photographers, house decorators, &c.; they are in good employ in the Civil Service; they are found in insurance and other large offices.

Education of the Blind.—When the eyesight is lost the other senses seem to gain a compensatory development: the touch becomes extremely sensitive, and the hearing very acute, and the memory becomes remarkably retentive. These are the points to be kept specially in view in framing a scheme of instruction for the blind. The first blind institution was founded at Memmingen by Duke Welf VI. in 1178; the second, in Paris, by St. Louis, in 1260. The modern institutions begin with M. Haüy's *Institut des jeunes Aveugles* at Paris, founded in 1784, and Dr. Johnston's House for the Employment of the Adult Blind, opened in Edinburgh in 1793. The number of institutions has increased greatly in recent years. The principal trades for which the blind are trained are: the making of baskets, brushes, brooms, mattresses, rugs, mats, &c., and

the caning of chairs; with knitting, sewing, and hair-plaiting, for women. Those with a special turn for music may become musicians, music-teachers, or pianoforte-tuners. In Great Britain, more is done in workshops; in America, more attention is given to literary culture and music—the blind being, as a rule, of a higher intellectual grade. The Worcester College for Blind Sons of Gentlemen, founded in 1866, trains even for the Universities. The Royal Normal College and Academy, at Upper Norwood, was opened in 1872, to afford a thorough general and musical education to the youthful blind of both sexes, with a view to self-maintenance. It embraces three distinct departments: (1) general education, (2) the science and practice of music, and (3) pianoforte-tuning. Much has been done for the blind in recent years by the exertions of the British and Foreign Blind Association, which was 'formed for the purpose of promoting the education and employment of the blind, by ascertaining what has been done in these respects in this and other countries, by endeavouring to supply deficiencies where these are found to exist, and by attempting to bring about greater harmony of action between the different schools and institutions.'

PRINTING FOR THE BLIND.—I. *The Roman Letter.*—M. Haüy of Paris was the first (in 1784) to conceive and execute the idea of printing on paper letters recognisable by touch. He adopted the script or italic form of the roman letter. After creating a great temporary sensation the system fell into abeyance. James Gall, a printer and publisher of Edinburgh, set himself (in 1826) to remedy the defects of Haüy's system, adopting the common alphabet (modified so as to be easily felt) as the basis, with preference of the lower-case forms, and providing for fluency of reading by large and legible letters. In 1827 Gall printed his *First Book* in a triangular modification of the common alphabet, embossed in high relief; and he followed up this with several little volumes of Scriptural matter. He printed in 1832, and published in 1834, his great work, *The Gospel by St. John*, which was the first book of the Bible which had ever been printed for the blind in any language. This volume was printed in a type so large and legible, that some of those whom Gall had taught 'were able at the public meetings to read any passage put before them through six plies of silk between the book and their fingers.' The letters were roman capitals, with angular lines instead of curves. Gall endeavoured to make the alphabet approach as near as possible to its usual form without losing its tangibility, and he increased the tangibility by using serrated types, the letters being formed of dots instead of lines; he also introduced initial capitals as in ordinary use. Dr. Howe, of Boston, U.S., visited Gall, and on his return to America established a printing press; he published the Acts of the Apostles in 1834, and the whole New Testament in 1836–42. He used Gall's angular modification of the common alphabet, but in much smaller size. Meantime Sir C. Lowther had introduced Haüy's type into England (1832), and printed some portions of the Bible; and Jacob Snider, of Philadelphia, working without knowledge of other achievements in the same field, had published (1834) the Gospel by St. Mark, unfortunately in capitals. Strange to say, John Alston, treasurer of the Blind Asylum in Glasgow, printed, in 1837, the Gospel by St. Mark in the very type used (unknown to him) by Jacob Snider. In 1838 Alston completed the New Testament, and in 1840 the whole Bible—the first complete Bible for the blind in any language. But his system encountered the fatal objection of insufficient legibility; he had used the Roman capitals, and his type was too small. Roman capitals had been tried in America in 1834, and in 1837 Dr. Fry, of London, had gained with them the gold medal of the Scottish Society of Arts for the best alphabet for the blind. Improved modifications have been independently suggested, in almost identical terms, by Mr. Welch, a pioneer of education among the blind of London, and by Mr. Littledale of Cheltenham. In Germany there have been various modifications of the Roman letter, the chief being the *Stachelschrift* of Stuttgart, which consists of Roman capitals formed by finely dotted lines. II. *Arbitrary Letters.*—Mr. Lucas, of the Bristol Institution, invented a stenographic shorthand, with arbitrary characters and numerous contractions; printing St. John in 1837, and the Acts of the Apostles in 1838, and eventually the whole Bible and many other works. Mr. Frere, of London, in dissent from Mr. Lucas, developed a rival phonetic shorthand; and, under the

criticism of an intelligent blind man, he replaced his dotted curves by angles of 45°, and his dotted lines by lines in which a short stroke is substituted for the dot—thereby gaining a great superiority in the quality of easy recognition. Frere also invented the system of 'return lines;' that is, the lines in his books are read from left to right and from right to left alternately, the letters themselves being reversed in the return (right to left) lines. Dr. Moon, of Brighton, adopts from Frere the return line, but without reversing the letters; and his alphabet, while arbitrary, yet is largely suggestive of the common type. He prints in larger size than any one else, so that his books are bulky and expensive; but they are far more popular than any others, and now they embrace a wide literature. III. The *Dot Letter*.—The *Braille System*, invented (1834) by M. Braille, a blind pupil of the *Institut des jeunes Aveugles*, is universal in France, both for writing and for printing; it is much used, for both purposes, in Switzerland; and it is employed as the *written* character in almost all countries, except the United Kingdom. It consists of the sixty-two varieties of form obtainable by the omission of one or more of six dots placed in an oblong, of which the vertical side contains three, and the horizontal two dots, thus :— ⁞⁞. These forms comprise not only the letters of the alphabet, but also many other signs. This system has two powerful advantages. it is easily written (*see* below), and it is the best of all known methods of writing and printing music for the blind. An improved system, by Mr. Wait, of New York, proceeds on the principle that the letters occurring most frequently in the English language should be represented by the fewest number of dots, and that the letters should be so spaced that a letter composed of one dot should not, as is the case in the French system, occupy the same room as one with six dots. For this purpose the oblong, consisting of six dots, composing the root-form of the letter, is placed horizontally, instead of vertically; the greatest vertical depth of any letter is two dots instead of three. From these two changes results a saving of about one third in space; this involves a saving of about one-third in the price of printed books; writing is rendered more rapid; as the size can now be increased, owing to the diminution of the vertical length of the letter, it can be made sufficient for the dullest touch. Ten-word and part-word signs have been introduced, which effect a further saving of nearly one-third, while they do not interfere in the least degree with correct spelling. These advantages make it well worth while to consider whether the modification of the Braille system ought not to be adopted as the written system of all English-speaking blind.

WRITING FOR THE BLIND.—I. *By the Blind to the Blind*.—Messrs. Milne and McBain, of the Edinburgh Asylum, invented the 'string alphabet,' the letters of which were represented by different kinds of knots tied upon a cord, singly or combined. Gall superseded this (1838) by writing stamps. The stamps are cubes of wood fitted with pins in shapes forming letters; the paper is laid on a soft surface, and the pin points are pressed through it, a raised letter being thus produced on the other side. In M. Braille's system, 'a frame is used consisting of a grooved metal bed, containing ten grooves to the inch; over this is fitted a guide, whose vertical diameter is $\frac{3}{10}$ inch, while the horizontal diameter is $\frac{2}{10}$. This perforated guide is fixed into a light wooden frame, like the frame of a slate, which is attached to the grooved metal bed by hinges. The paper is introduced between the frame and the grooved bed. The instrument for writing is a blunt awl, which carries a little cap of paper before it into the grooves of the bed, thereby producing a series of little pits on the side next the writer. When taken out and turned over, little protuberances are felt, corresponding to the pits on the other side. The reading is performed from left to right, consequently the writing is from right to left; but this reversal presents no practical difficulty, as soon as the pupil has caught the idea that in reading and writing alike he has to go forwards. The brass guide has a double row of openings, which enables the writer to write two lines; when these are written he shifts his guide downwards, until two little pins, which project from the under surface at its ends, drop into the corresponding holes of the frame, when the writer writes two more lines, and this operation is repeated until he arrives at the bottom of the page. The first ten letters, from 'a' to 'j,' are formed in the upper and middle grooves; the next ten, from 'k' to 't,' are formed

by adding one lower dot behind to each letter of the first series; the third row, from 'u' to 'ù,' is formed from the first by adding two lower dots to each letter; the fourth row, from 'â' to 'w,' similarly, by adding one lower front dot. The first ten letters, when preceded by the prefix for numbers, stand for the nine numbers and the cipher. The same signs, written in the lower and middle grooves, instead of the upper and middle, serve for punctuation. The seven last letters of each series stand for the seven musical notes—the first series representing quavers, the second minims, the third semibreves, the fourth crotchets. Rests, accidentals, and every other sign used in music, can be readily and clearly expressed, without having recourse to the staff of five lines which forms the basis of ordinary musical notation. By means of this dotted system, a blind man is able to keep memoranda or accounts, write his own music, emboss his own books from dictation, and carry on correspondence. II. *By the Blind to the Seeing.*—Mr. St. Clair, a music teacher in Edinburgh, and Mr. Gall, used carbonised paper and a fine hard point (pencil or stylus). St. Clair's guide consisted of a line of small square holes, each representing a letter or a space; Gall's 'typhlograph' was much more elaborate, and had a small projection in the middle of the right side to mark the size of letter. But the better educated write just like the seeing, only with a special guide for the lines.

Education (Physical). *See* PHYSICAL EDUCATION.

Education (Practice of). *See* PEDAGOGY and SCHOOL MANAGEMENT.

Education Society.—This society was founded in 1875 'for the development of the science of education.' The object of its promoters is to collect, examine, and classify facts, and to establish and propound those principles on which the practice of education should be based. In particular, the society has maintained the importance of connecting the study of the science of psychology with the exercise of the art of teaching; and has urged the necessity of the systematic training of teachers. Papers are read and discussed on every third Monday of the month at 8 p.m. at the Memorial Hall, Farringdon Street, E.C.; and an annual volume of *Transactions* is published. In January, 1887, the work of the society was amalgamated with that of the education section of the 'Teachers' Guild' (*q.v.*), but is being continued otherwise unchanged.

Education (Commercial) and (Technical). *See* TECHNICAL EDUCATION.

Education (Theory of).—The term theory is opposed to practice. In distinguishing the theory from the practice of education we mark off the scientific groundwork of the art. That is to say, the theory of education aims at setting forth those scientific truths or principles which underlie the rules followed by the practical educator. These principles are derived from a number of special sciences, among which may be mentioned physiology, which supplies the truths underlying physical education, and psychology or mental science, which gives us the principles to be applied in the training and development of the mental faculties. With this last must be taken logic, which furnishes rules for the right discipline of the reasoning faculty; and ethics, which, by defining the ultimate end of all action, serves at once to give us a clearer idea of the purpose of education as a whole, and to supply us with a true ideal in developing the moral side of the child's nature. The theory of education, which, like all other theories, follows a certain development of the corresponding practice, may be said to aim first of all at scientifically explaining, and so providing a sure reason for those practical maxims which have been reached by the empirical method, i.e. as the result of actual trial and a comparison of the results of different workers (*see* EMPIRICAL METHOD). More than this, a complete theory of education should enable us to detect errors in practice and to deduce new rules to be afterwards tested and verified by experience. It is evident from this brief definition that the theory of education, though in a manner opposed to the practice, is organically and inseparably united with it. While of the greatest value when moving in association with, and under the guidance of, practical experience, it is apt when divorced from this to wander into the region of vague and unfruitful speculation. While theory is thus valueless detached from practical observation, it becomes of the very highest worth when properly conjoined with this. The conviction is now steadily gaining ground among teachers that a study of the scientific principles which make up the

theory of education is a necessary part of the preparation for the work of teaching. (*See* Professor Payne's *Lectures on the Science and Art of Education*, Lectures i. and ii : J. Sully's *Teacher's Handbook*, chap. i. ; W. H. Payne's *Contributions to the Science of Education*, chaps. i. and ii.)

Educational Institute of Scotland (The) is incorporated by Royal Charter. The members consist of (*a*) Fellows, who are admitted on the recommendation of the local association within whose bounds they reside, or by direct application to the Board of Examiners with production of relative testimonials and certificates. The grade is honorary, and is conferred only on those who have attained a prominent place in the profession, and who have taught publicly and satisfactorily for at least twelve years. The diploma fee is two guineas, with an annual subscription of five shillings. (*b*) Associates (senior and junior), who are admitted by examination, or on producing Government certificate, university degree diploma, or some similar satisfactory evidence of professional acquirements. The diploma fee is for seniors one guinea, for juniors half-a-guinea, with five shillings annual subscription. (*c*) Members, who are admitted by the Board of Examiners on the recommendation of any local association within whose bounds they reside. Diploma five shillings ; annual subscription five shillings. (*d*) Probationers, who are admitted at any ordinary meeting of a local association. Annual subscription two shillings and sixpence. All communications respecting admission to the Institute should be addressed to the Secretary to the Board of Examiners, Thomas Morrison, LL.D., F.E.I.S., Free Church Training College, Glasgow.

Educational Ladder. *See* INSTRUCTION (COURSE OF).

Educational Law. *See* LAW (EDUCATIONAL).

Efficient Schools. *See* CLASSIFICATION.

Egypt. *See* SCHOOLS OF ANTIQUITY.

Elaborative Faculty.—According to certain German pedagogists there are three principal stages in intellectual development—reception, reproduction, and elaboration. This last includes the whole process of separating and recombining, and thus transforming the materials of thought originally supplied by the senses and rendered available by the reproductive faculty. This work of elaboration may assume one of two unlike forms, issuing in the production of new pictorial representations, the imaginative products of the poet, or in general or abstract ideas reached by combining a variety of particular ideas or images, and constituting the products of thought. As subserving the ends of knowledge this second form of elaboration is of much the greater consequence, and writers like Sir William Hamilton, who employ the phrase 'elaborative faculty,' confine it to the operations of comparison, abstraction, &c., which constitute thought. The separation of a receptive, a reproductive, and an elaborative stage in mental growth must not mislead us into supposing that the child in receiving external impressions, whether directly from objects or through the medium of others' words, is at the time purely passive, and only begins to organise these impressions into knowledge later on. In truth the reception of an external impression only amounts to true acquisition when it is completed at the time by a reproduction of past impressions and a rudimentary process of elaboration. (*See* ACQUISITION OF KNOWLEDGE.)

Electricity.—The questions we shall set ourselves to answer in regard to this subject are : What are the place and purpose of electricity in education, and how should it be applied ? The recent rapid and immense development of electrical science should justify the suggestion of these questions. No branch of human knowledge ever made such rapid strides as this one ; none of the forces of nature which have been subjugated to the service of man have in so short a time grown from pigmies to giants, and none now make such promises, or seem to possess such potentialities for future service as those which are produced by means of electricity. Although it is true that the subjects which are to form the instruments of education must be selected on account of their utility as disciplines of the mind, and not simply because of their practical applications in the business of life, yet it has come to be accepted as an axiom amongst teachers that where two studies serve the same purpose in education, that one should be preferred which is the more directly useful. The general purpose of science in education is to cultivate in the student an intelligent attitude of mind in relation to the things and

phenomena about him, and to give him ability to observe and examine them, to describe and reason about them, to control and use them. When looked at in the light of this, the science of electricity possesses many features which give it a claim to the foremost place amongst what are known as the physical sciences. It is readily systematised ; it presents at every step laws to be traced out and verified, and the connections of these laws constitute some of the best examples of scientific reasoning. Hence, the teaching of electricity has ceased to be a mere lecture-room exhibition of tricks and startling effects, and has become a veritable science. It can be commenced without much preliminary drill, for it has no peculiar and special alphabet of its own. If magnetism be included in this science of electricity, the apparatus required for the first experiments is of the simplest kind, and the experiments at first are such as a child can perform and can understand. Yet the results obtained with this simple apparatus are not to be predicted without experiment, and they afford simple but comprehensive illustrations of the nature and construction of natural laws. At the same time, in every part of the subject there is always something to learn, and the things in it which even a child may understand lie very near to other things which are too deep for the most profound philosopher.

Again, this science has intimate connections with all other members of the group of physical sciences—mechanics, dynamics, heat, light, sound, and chemistry. Indeed, if these are treated but as handmaidens or attendants on electric science, designed to be called up and used only when required for the assistance of their chief, there will be few, if any, of the main attributes of any one of them which can remain unknown.

Another point which should recommend it for school and college use is that it is a mathematical science utilising the whole range of mathematics, from the simplest form of equation to the highest efforts of analysis. It serves, therefore, as a stimulus to mathematical studies by creating a demand for a knowledge of mathematical processes. In attempting to put electric principles before the general student, the fact that these principles are essentially of a mathematical character should never be ignored. It is true that in applications of electricity, as in applications of mechanics, the student is often able to arrange apparatus with which many curious phenomena may be observed without his having much knowledge of electrical or mechanical magnitudes ; but there can be no doubt that there is an immense waste of time and knowledge due to attempts of this kind. Indeed, it may be laid down as a general rule for electrical students that he who has not a quantitative knowledge of the principles of electrical science will only waste his time in making original experiments

Finally, it is by disseminating an accurate knowledge of what has been already established that further important acquisitions may be secured. It is not only by the study of the few, but also by the intelligent observation of the many, that the most recent discoveries have been brought about. It is by the spread of education among the masses of the people that we are hastening the discovery of new civilising agents. The history of electrical engineering during the last fifteen years is one of the best illustrations that can be given of the fact, that for many people to have some knowledge, however low in level it may be, is as necessary to the development of discovery as for a few people to have greater knowledge, however high in level it may be. For all these reasons together electrical science deserves the first place in the school and college science course, and when one branch only is taken this should be the one.

As regards the method of teaching, we must first remark that the best order for elucidating the principles of this and kindred sciences is, as a rule, the historical order of discovery. The facts that are first found in order of time are those which are most palpable and lie nearest to hand ; while, on the other hand, the discoveries of recent years are drawn from the more intricate phenomena, which require to be searched after. But this order of development is often exactly the reverse of the order of importance and utility as regards the purposes of life ; nor is the order of discovery always identical with a logical arrangement. We may take account of this difference by first expounding to beginners the principles of electrical science in their historical sequence, and then with more advanced students forsaking tha

rules which teach us to pronounce written or extemporaneous composition with justness, energy, beauty, variety, and ease; and as thus defined the art was largely, and with enthusiasm, studied by the Greeks and Romans, to which study in a great measure we owe some of the finest pieces of ancient oratory extant. They distinguished the various qualities of elocution by simple epithets, such as smooth, clear, slender, full, flowing, flexible, sharp, rigid, and hoarse; and designated the pitch of vocal sounds by the term accent, making three kinds of accents—the acute, the grave, and the circumflex, which signified severally the rise, the fall, and the turn of the voice, or union of acute and grave on the same syllable. They did not, however, go much beyond this, and it was left to modern inquirers to give that clear and full description of the elements of speech on which any attempt at full and satisfactory instruction can be founded. The subject has in our day been minutely, and in some respects satisfactorily, analysed. The speaker should always be natural; and the best means to accomplish this end is to have confidence, courage, and frequent practice. He should read frequently aloud, and declaim occasionally in the open air. Bodily exercises are also of great advantage, as everything that tends to the improvement of the health has a corresponding influence upon the voice. All excesses, however, are injurious, and should be avoided; thus the voice should be exercised with care when it is breaking, or immediately after meals, or when hoarse, although a slight cold often improves the raucous quality of the voice. Wines and spirits are also injurious; and it should be added that the simplest and best remedy for thirst when speaking is a glass of cold water with a little gum arabic dissolved in it. It is a mistake for a speaker to think that he is best heard when he speaks loudest, for such speaking is disagreeable in itself, and extremely fatiguing both to the speaker and the hearer. When the natural extent of voice in ordinary conversation is not sufficient, the speaker should extend that tone, but preserve the usual key. Weakness of the voice is always overcome by loud and forcible expulsion from the glottis of the various vowel sounds. There must also be distinct articulation. This depends on the clear enunciation of certain elements called usually consonants, which may be generally described as certain modes of beginning, ending, or interrupting vowel sounds. Sounds and articulation of a similar formation should not be allowed to coalesce, as, e.g., the classical illustration of Milton's attack on Bishop Hall's *teach each*. Distinctness requires that each sound shall be completed before another is begun, and at the same time that the end of the one and the beginning of the other shall be made so quickly that while the separation is distinctly effected, continuity may not be broken by any pause. It has been suggested that this may be avoided by a slight downward action of the lower jaw, which, separating the parts that produced the articulation, will leave them at perfect liberty for the utterance of the same, or a similar sound. Important words or passages, again, should be emphasized by their forcible expulsion from the chest. Attention should also be paid to inflexions, which are tones of speech proceeding by slides from one note to another. Rising inflexions indicate suspension, doubt, uncertainty, or incompleteness of sense, while falling inflexions indicate conviction or completion of sense. But no speaker can be a success without gesture, which should be simple, pleasing, varied, and, above all, graceful. He should suit his action, not to the word, but to the idea. His gesture should always accompany the expression, and should never be more frequent than the number of ideas. In a word, the speaker should always remember that he has to be heard, to be understood, and to be felt.

Emotions (The) are a variety of the feelings; that is to say, those changes or affections of the mind which are characterised by agreeableness or its opposite, and which are summed up under the familiar antithesis pleasure and pain, satisfaction and dissatisfaction, happiness and misery. Of these agreeable and disagreeable mental states there are two divisions: (1) those connected with the bodily life and resulting directly from the action of some nerve or nerves, as the feelings of heat, cold, hunger, and thirst, the pleasures of colour, sound, &c.; and (2) those which are the result of mental activity, as the feeling of gratitude, reverence, remorse, &c. The first division is marked off as Sense-feelings, the second as Emotions. The emotions show a certain order of development, which in general corresponds with the

grade of mental activity involved. Most of the characteristic emotions—as fear, anger, love, &c.—manifest themselves with more or less distinctness within the period of infancy. Others, again—as the feeling of justice, the love of truth—belong to a later period. The feelings that are developed first are those which subserve the ends of self-preservation. To the properly egoistic feelings there succeed the purer forms of social feeling, viz. disinterested affection for others, sympathy, and benevolence. The cultivation of the emotions, which proceeds partly by moderating the violence of early passion and by keeping the egoistic feelings within due bounds, partly by exercising and developing the higher emotions, is one of the most important and yet most difficult departments of education. Its importance arises, first of all, from the circumstance that feeling, while in its more excited forms a serious obstacle to intellectual activity, is at the same time the sole source of what we call interest in study; and, secondly, from the fact that feeling supplies the incentive to action, and that right conduct is only possible where there is a preponderance of the higher feelings over the lower. While the educator has thus to give special consideration to the feelings in connection both with intellectual and moral education, he seeks more especially, in what we call æsthetic culture, to cultivate the feelings for their own sake, i.e. as a source of refined and lasting enjoyment. (*See* ÆSTHETIC CULTURE.) The special difficulty in emotional culture is due to the great differences of temperament and natural sensibility among children, and to the circumstance that the development of an emotion is a gradual process implying the co-operation of experience, association, and internal reflection. Probably, the most profound influence exercised by an educator on the emotions of his pupil, is by way of sympathy and unconscious imitation. A child insensibly tends to enter into and reproduce those modes of feeling which it sees habitually manifested by those about it; and where there are love and respect for the teacher this tendency to take on another's feeling becomes reinforced by the magnetic attraction of example. (*See* IMITATION.) (*See* Bain, *Education as a Science*, chap. iii.; J. Sully, *Teacher's Hand book*, chap. xvi., and Schmidt's *Encyclopädie*, article 'Gefühlsbildung.')

Empirical Method.—By the phrase empirical knowledge, is meant knowledge gained by experience and observation only. It contrasts with scientific or rational knowledge which has been carefully ascertained by scientific methods of reasoning. The larger part of human knowledge has been first acquired as empirical, and is only gradually becoming transformed into rational by a process of scientific explanation. In this way, for example, the succession of day and night, and of the seasons, the effects of foods, poisons, &c., on the human organism, were phenomena long known as a matter of observation, before they were deduced from scientific laws. As the human race has necessarily progressed from empirical to rational or reasonable knowledge, those who, like Mr. Spencer, maintain that the mental development of the individual should follow that of the race, would urge that the natural and sound method of teaching is first of all to exercise the child's mind in the accumulation of a store of empirical generalisations, and only to take it on to a higher and truly scientific knowledge of nature's operations when the reasoning faculty is more fully developed. (Compare articles METHOD and EVOLUTION.)

Emulation may be briefly defined as the desire to surpass or excel another in any exploit fitted to bring honour. It is thus closely related on the one side to ambition, or the desire for eminence and distinction (*see* HONOUR); and on the other to rivalry or the desire to defeat another for the sake of the pleasure of victory and of superiority. So far as the latter personal feeling becomes conspicuous emulation degenerates into a distinctly anti-social and malevolent feeling. In what is commonly understood by emulation, however, as distinct from rivalry, the feeling of personal antagonism is not allowed to rise into clear consciousness, and the thoughts are fixed on the coveted honour. As appealing to one of the strongest feelings in human nature, emulation has always held a prominent place among the forces of the educator. It is the natural accompaniment of the teaching of numbers, as illustrated in place-taking, prize-winning, and so forth. Its utility as a motive is greatly diminished by the circumstance that it affects a comparative few only—that is, the more forward members of the class, and leaves just those unmoved who

most of all require stimulus. In addition to this it must be borne in mind that the situation of competition or contest always tends to develop a feeling of antagonism, and is pretty certain to do so where the contest is fierce and prolonged. Hence, while a large employment of this motive, as in the system of the Jesuits, may favour the development of habits of industry, and a spirit of self-reliance, it tends to the formation of a selfish and unsympathetic type of character. So far as the motive is made use of by the teacher, everything must be done to discourage the feeling of personal antagonism, and to direct the thoughts of the competitor to the worth of the distinction in and for itself. (*See* Bain, *Education as a Science*, pp. 74 and 114; Sully, *Teacher's Handbook*, p. 380.)

Endowed Schools. *See* GRAMMAR SCHOOLS.

England and Wales (Education in). *See* CODE; LAW (EDUCATIONAL); INSTRUCTION (COURSE OF), and WELSH EDUCATION.

English (The Study of).—Under the general heading 'English' there is commonly included a surprising variety of matters, some of which could not have found their way there except as the result of curious historical accidents—chiefly of contrasts. As opposed to classics, or 'Modern Languages,' 'English' is often held to comprise history—even the history of Greece and Rome, and geography (physical as well as political), and even arithmetic. We must limit the application. Looking first to the elementary treatment of the mother-tongue in primary schools, we observe that children come to the actual study of English with a certain basis of acquired speech. In learning READING (*q.v.*), they are gradually led to recognise the written or printed forms that represent the sounds with which they are already familiar, as representing varieties of meaning; and they increase their vocabulary. The first steps are by no means easy. By one method, called the 'LOOK-AND-SAY' METHOD (*q.v.*), they are accustomed to apprehend at once a cluster of letters as representing a particular meaning; they take the words as wholes, without any attempt to resolve them into their component letters or syllables. By another method they are gradually trained through a systematic series of examples of the regular values of the several vowels and consonants in the most common typical combinations: a plan that has been carried out by Professor Murison with much care and completeness in the *Globe Readers*, published by Messrs. Macmillan. The chief irregularities being found in the more common and shorter words, however, it is unavoidable to introduce some words at an early stage on the Look-and-Say principle; and no doubt a judicious mixture of the two methods, with the Look-and-Say in the utmost feasible subordination, is the best that could be devised. The RECITATION (*q.v.*) of passages, both of poetry and prose, is a popular exercise in all schools: it trains and strengthens the memory, and cultivates the taste, at the same time storing the mind with memorable utterances of moral as well as intellectual value. *Writing*, in the sense of copying out passages, is also a useful means of impressing the youthful mind; it conduces to accuracy, and it is especially helpful in acquiring and fixing the more troublesome bugbears of SPELLING (*q.v.*). This is the most arduous of all the tasks of the school children—to master the English spelling. The chief difficulties lie in the most common words: yet the exceptions to the general rules can be grouped into classes, and thus conquered easily in detail. Nor are they so very numerous, or so very difficult, as is frequently supposed. Many authorities now consider it is a most wasteful thing to spend much time over the inculcation of conventional spellings, and urge that when the teacher has given a moderate amount of attention to the matter by insistence on the similarities of classes of words, with contrast of the common dissimilarities, he has done quite enough. 'This educational fetish,' says Professor Murison, 'has exacted a ruinous tribute of worship, which ought to be materially diminished forthwith.'

Assuming that the pupil can read and write and spell, with reasonable fluency and accuracy, we may now consider the vocables and mechanism of English speech. The individual words may be examined as to *meaning* and *derivation*. Obviously, it is essential that the precise meaning, or meanings, in which a word is now used, should be clearly apprehended; the preceding vicissitudes through which it may be traced will always have a certain interest, although necessarily an inferior importance. It will also be useful to discriminate words of the same form with

different meanings, and different words with more or less similar meanings. In derivation, the main point is, to apprehend the forms—the precise use of prefixes and suffixes, and the occasional modifications of vowel; to trace back the word, through endless varieties of arbitrary spelling, it may be, to *Anglo-Saxon* or possibly Sanskrit roots, is an attractive exercise that must be jealously watched as a great 'thief of time.' The main object is to know the modern usage. The discrimination of *synonyms*, it should be added, is far too apt to be pursued into unwarrantable hair-splitting; for all purposes, the young pupil should be satisfied with the broad and unquestionable distinctions.

GRAMMAR (*q.v.*) deals more particularly with the putting together of words in sentences. Its province is not very rigidly limited. On the one hand it usually includes derivation, while on the other it passes more or less into composition, its more peculiar subjects being *Parsing*, or the definition and classification of the 'Parts of Speech,' and ANALYSIS (*q.v.*), or the separation of sentences into their component members, and the consideration of the precise relations of such members. One set of grammarians, represented chiefly by Dr. Richard Morris, would make it the main purpose of grammar to trace back the grammatical forms to the earliest times. Such an investigation is no doubt a proper work for a scholar, and the leading practical results ought to be embodied in English grammars that profess to go any distance into details. But, after all, the first object of the teacher of grammar ought surely to be to present it as it stands at this present day; all excursions into the past being severely regulated according to the time and future career of the particular students. The logical training to be obtained through grammar is somewhat delusive; still, the definitions, classifications, and distinctions ought to be presented as logically as possible. The crabbed nomenclature of grammar is, at best, repulsive to the young pupil. This difficulty, however, may be got over by exercising the pupil systematically in the interchanges of all the equivalent forms of expression in English. 'The pupils,' says Professor Bain, 'are thus accustomed to weigh every expression that comes before them, and this I take to be the beginning of the art of composition.' The system has the important advantage of being teachable from the very start of grammatical training up to the most advanced composition, as well as of exercising the minds of pupils at every stage in the essential matter in the whole study—the weighing of all forms of expression with a view to the intelligent selection of the fittest. (*See* Professor Murison's *First Work in English*: Longmans.) The practice of *Paraphrasing* is now condemned 'as the most deplorably desecrating and execrable that could have been seriously proposed;' it will hardly be able to survive the astounding reports of the Government Inspectors of Schools—notably, Mr. Matthew Arnold's experience (1876) with 'Canst thou not minister to a mind diseased?' and 'Now witchcraft celebrates.'

In higher schools, and for public examinations (e.g. University Local Examinations), it is usual to prescribe a play of Shakespeare or some of Bacon's Essays, or similar selections of prose and verse. The question then arises: What is the pupil to do with it? The answer is given in the notes to some popular edition. Take, for example, the editions of the Clarendon Press—and the same remarks will apply, more or less, to most other editions of a less elaborate character. What do we find? In the words of Professor Bain, 'discussions of antiquarian grammar, idiom, and vocabulary; changes in the use of particular words; explanation of figurative allusions; interpretations of doubtful passages;' and so forth. 'Very little attention is usually given to the author's merits and defects, which are equally conspicuous, and equally instructive.' So with Bacon, or with Milton. There is no question of the ability of the writer, or of the importance and interest of his work; but the treatment is far removed from modern style, and it is almost wholly bad example, and the matter itself might be profitably replaced by more modern compositions. Such editions ought to be used in private study at a later stage. The time of the pupil at school ought to be directed to the great practical purpose of discriminating between the good and bad in composition; in the words of Dryden: 'to understand the purity of English, and critically to discern not only good writers from bad, and a proper style from a corrupt, but also to distinguish that which is pure in a good author from that which is vicious and corrupt in him.'

The time of the pupils is so limited that the teacher is bound to consider: (1) what can and what cannot be taught; and (2) what it is more profitable to teach and what it is wise to omit. In other words, what is the best he can do for his pupils, that his pupils cannot conveniently do for themselves? Keeping the practical end of good composition steadily in view, he can exercise them in grammatical construction, with the right application of words and idioms, and the peculiarities of syntax. Passing into the borderland between grammar and RHETORIC (*q.v.*), he enters the extraordinarily profitable field of arrangement or order of words. The figures of speech ought to be well studied in a carefully chosen series of examples; the chief intellectual qualities of style (simplicity, clearness, energy, or impressiveness) require long practice, and the emotional qualities reach forward into the highest criticism and practice. Without this preliminary training, it is venturesome to embark on any of the large forms of composition—description, narration, exposition, persuasion, poetry. Genius can no doubt overleap intermediate barriers, but even genius would be all the better for the discipline of continuous many-sided study. In *essay* writing, the composition exercise is hampered by the totally extraneous exercise of finding the necessary material and mastering it for use. In this form of English exercise more than in any other it is necessary to discriminate the several elements of the performance, and to relieve learners as far as possible from work that cannot reasonably be regarded as entering into training in English style. And there is much scope for simplification; for instance, there ought to be a clear separation of the various kinds of composition—if the exercise be description, let the student keep clear of exposition; if it be narrative, limit him rigidly to narration; and so on. There ought to be much exercise and great acquired facility in simple compositions before undertaking the more complex efforts.

The field of *English Literature* is a sore puzzle to those among us who desire to enlarge the appreciation of English, in the form of 'School' or 'Tripos' in the Universities. What is a professor to teach under the name 'English Literature'? The language of bygone centuries would always be assumed by him; presumably, the understanding of the old forms would be a philological exercise, separate, and purely preliminary. The personal history of authors, the succession of authors, the substance of a poem or a play, or a chapter of a history—such matters as these need no professorial aid. The true work of a professor would seem to lie in the careful analysis of typical works, with a view to displaying their qualities as composition and as 'literature.' It is an art of literary anatomy. Both teacher and student ought to come armed with some such full analysis of literary forms as may be found in the best books on rhetoric and composition, and the application should then be made, and in a liberal spirit. Professor Minto's *Manual of English Prose Composition* and *Characteristics of English Poets* (Blackwood) contain the finest examples of such work. A less tangible, yet useful and suggestive, line may be seen in Mr. R. G. Moulton's studies of Shakespeare's art. The acknowledged leaders in criticism, past and present, must of course be deferentially studied; but the anonymous criticism of current literature ought not to be followed without deliberate testing by the light of well-ascertained principles. The thing is to be grounded in principles, with an open mind to the possible transcending of lower into higher principle; the greatest danger lies in a tendency to narrow criticism. But, above all, the student should leave his teacher with two things—'a strong love for the study of English, so steadily and timeously and judiciously inculcated as to be unquenchable, and in kind companionship with this, a wise and well-tried code of directions for the application of the love of English to the fruitful study of the incomparable literature in English.' (*See* Professor Bain's works: *English Grammar*, *English Composition and Rhetoric*, and *On Teaching English* (Longmans); Professor Minto's works, as above; Preface to Professor Murison's *First Work in English* (Longmans); Mr. R. G. Moulton's *Shakespeare as a Dramatic Artist* (Clarendon Press); an article 'On the Teaching of English' (*Time*, May 1887); *English Literature, and how to study it* (*Pall Mall Gazette* Office).

Epidemic Diseases so frequently disorganise school-work by reducing the attendance that a study of their nature and mode of propagation is of the highest

importance to every teacher. The chief epidemic diseases which are of importance in connection with school-life are scarlet fever, diphtheria, small-pox, chicken-pox, measles, German measles, mumps, and whooping-cough. These are all extremely infectious, and apt to be spread by the close intercommunication occurring in school-life. The following rules may help the teacher in taking action in any doubtful case: (1) If a child appears at school with a suspicious rash on his skin, or if he vomits, or is feverish and languid, send him home at once. (2) A bad sore-throat might indicate scarlet fever, diphtheria, German measles, or a simple sore-throat. In any case send the patient home at once, and ask the mother to keep him away till the true nature of the complaint becomes certain. (3) If a child is suffering from a severe cold, with sneezing and redness of eyes, it may mean an influenza cold or the onset of measles. As both are infectious, send the patient home at once. (4) A swelling in front of and below the ear generally means mumps; and a violent paroxysmal cough, making the child sick, or bleed at the nose, or become blue in the face, generally means whooping-cough. In all *doubtful* cases act as though the case were an infectious one. *Duration of Infection.*—The earliest period at which a pupil may return to school after the onset of an infectious disease should theoretically correspond with the end of the period of infection, but it is always wise to allow a margin; and even then a medical certificate of freedom from infection should be insisted on. Thus after scarlet fever school attendance should not be resumed until at least six weeks from the commencement of illness, and then only if all peeling is completed. In diphtheria the infection lasts two to three weeks, but school attendance should only be allowed in the fourth week, and not then if any sore-throat or discharge from ears, eyes, or nose continues. After small-pox and chicken-pox at least four or five weeks should elapse. The infection of measles usually ceases in two or three weeks, but at least three weeks should elapse before school attendance is resumed. For German measles three weeks are also required; for mumps four weeks; and for whooping-cough at least eight weeks, before school attendance is allowed. The above periods represent the minimum interval allowable. The *admission to school of apparently healthy children* from infected households should always be forbidden. The only possible exceptions are for mumps and whooping-cough. Apparently healthy children may carry the infection in their clothes, or they may be really suffering from an early stage of infectious disease, or a slighter form of it in a later stage. Measles, scarlet fever, &c., are infectious as soon as the earliest symptoms start, and before the appearance of the rash. It seems a great hardship that healthy children should be prevented from attending school because others in the same house have infectious disease. The only legitimate way out of the difficulty is (1) to remove the infectious case to the hospital, or (2) to remove the healthy children to another house. If either of the above courses are taken, then the children may resume school attendance after an interval has elapsed to allow of the development of the disease if it is already in the system. This period, which we may call the *quarantine period*, will vary in different cases, according to the varying time taken for each fever to develop. For a trustworthy table of periods during which these diseases are not infectious and no symptoms are present, *see* Dr. Newsholme's *School Hygiene*.

In case healthy children have been in the same house as a fever patient throughout the course of the illness, it will not be sufficient to prevent them coming to school until the end of the period of infection, but for a subsequent quarantine period as well. Thus, after scarlet fever six weeks, *plus* two weeks, should elapse; after diphtheria twenty-one, *plus* twelve days, and so on. Of course when the healthy children have been removed to another house, this prolonged quarantine is not necessary.

It occasionally happens that disease has been acquired by children from unsanitary conditions of the school premises. This more particularly applies to typhoid fever (i.e. enteric fever) and diphtheria. In this case the school should be closed during the necessary repairs of drains, &c., and the water-supply should be strictly investigated. In boarding-schools an impure milk-supply is sometimes the cause of an epidemic outbreak.

Epistolæ Obscurorum Virorum. *See* RENAISSANCE (*Obscurantists*).

Erasmus. *See* RENAISSANCE and REFORMATION.

Erech. *See* SCHOOLS OF ANTIQUITY, sect. *Assyria.*

Ergänzungsschule. *See* LAW (EDUCATIONAL).

Essays.—The art of expressing oneself clearly and adequately in one's native tongue is not in the main a gift of nature, but a result produced by much practice and constant attention to good models. This practice can be rendered far more effective, and the results may be arrived at sooner, by a well-ordered and gradually progressive plan. We require (*a*) an order in the subjects, corresponding to the growth of the pupil's mind and knowledge; (*b*) an order in the amount of personal original effort on the part of the pupil; and (*c*) an order of treatment—both as to the actual complexity of the language employed, and as to the faculties called into play. We want also a corresponding graduated *set of models*, with which the pupil's compositions can be and should be compared, the ground of his inferiority being made quite clear. The *order of subjects* will be best derived from that of the growth of the faculties; subjects which exercise the senses, observations of things made there and then by the pupils, those which require mental reproduction or memory, those which exercise the constructive imagination, and so on. The particular subjects chosen will of course depend upon the other school-work of the pupil, the knowledge he gets, and the life he leads. The order of personal effort will naturally be from oral composition to written work. The pupil should always be required to use complete sentences when answering questions, and to be clear. He should gradually be encouraged to answer more fully. In the written work we should begin by reading short passages or stories aloud, and requiring the pupil to reproduce them immediately afterwards—gradually changing the length, difficulty, and character of the piece, and encouraging the introduction of additions and variations. We may then give merely the main outlines of the story or passage, then merely the main points, and lastly the bare subject. In all these steps it will be well at first to choose the story or passage from some model—even when we give only the bare subject—so that at least one comparison may be made by the pupil. The *order of treatment* as to language, as far as it can be observed, will of course be from single short statements with simple subjects and predicates to those in which the subjects and predicates are more elaborate, and thence to compound sentences and complex sentences. As to the order of the faculties called into play, this will of course be the same as the order of the growth of the faculties—observation, memory, constructive imagination, &c., &c. Only in their later stages should essays be given as 'home-work.' If not treated as exercises in spelling, and if kept tolerably short, the work of reading and remarking on them need not be excessive. Essays should never be given back to a class without some oral comments on the leading characteristics shown by the class. With a large class there will not be time for more.

Essenes. *See* SCHOOLS OF ANTIQUITY, sect. *Judea.*

Ethics is the science which seeks to determine the ultimate end of human action, and, in close connection with this, the grounds of duty and moral obligation. It is thus at the head of the Practical Sciences, viz. those sciences which have to do with things—not as they actually exist, but as objects of desire or ideal ends. As the supreme practical science, ethics directs us in defining the true end of education. (*See* THEORY OF EDUCATION.) As concerned with the end of virtue or moral excellence, and with the systematic treatment of the several duties, ethics connects itself in a peculiar way with the problems of moral education. A study of ethics, by familiarising the mind with the difficulties inherent in moral problems, and by compelling it to harmonise different parts of the received moral code by reference to some uniting principle, may be regarded as a valuable part of the preliminary training of the educator. (*See* Prof. Sidgwick's *Outlines of the History of Ethics*, chap. i.; the same writer's larger work, *The Methods of Ethics*; Macintosh's *Dissertation*; or Professor Calderwood's *Handbook of Moral Philosophy.*)

Eton. *See* PUBLIC SCHOOLS.

Etymology. *See* GRAMMAR.

Euclid. *See* GEOMETRY.

Evening Classes. *See* ADULT EDUCATION and PROVINCIAL COLLEGES.

Evolution (Doctrine of).—By this expression is meant the theory—mainly elaborated in this country by Mr. Darwin, Mr. Herbert Spencer, and others—that differences of species among living things,

plants and animals, are not original and unalterable, but that the numerous existing varieties have gradually been evolved out of a few primitive forms. According to this doctrine man has attained his present physical and mental condition by a long series of gradual transitions or transformations from a humbler state. The doctrine of evolution has important bearings on education. In the first place it emphasizes the fact that human life is progressive, and that each generation is consciously or unconsciously working for a higher intellectual and moral condition in the remote future. Again, it teaches us that human progress is due not merely to the improving effect of better external circumstances, but to a certain advance in native aptitude and disposition. That is to say, the effect of the exertions, intellectual and moral, of each generation, transmits itself, to some extent, to its successor, according to the principle of HEREDITY (*q.v.*). Finally, the doctrine teaches us that the successive phases of the mental life of the individual correspond, broadly at least, with those of the mental life of the race. Mr. Spencer has applied this part of the theory of evolution to the problems of education, urging that the child should attain its knowledge as the race has attained it, proceeding from the concrete to the abstract, from the empirical to the rational. (*See* Spencer, *Education*, chap. ii.; W. H. Payne, *Contributions to the Science of Education*, chap. iv.)

Examinations are of two great classes: scholastic and official. The origin of the official examinations is distinctly traceable to the popularity of the scholastic examinations. Scholastic competitive examinations are at present universal in all places of education in this country, and are even more popular and more rigorous in some parts of the Continent. This is especially the case in France, where at the Polytechnic and at some of the military schools the two schools run into each other, scholastic victories being the best if not the only passport to some kinds of official employment. In England competitive examinations for scholastic purposes are comparatively modern. At Oxford the system, as applied to degrees, is only a little over fifty years old. At Cambridge it is considerably older, but within the last sixty years it has taken altogether a new position, and at present forms the great motive power by which the whole of the education given at the University is imparted. And at the Inns of Court the regular system of examination as a condition precedent to call to the bar was only introduced in 1872. Previous to 1855 there was much discussion as to the mode of filling up junior appointments in the public service by nomination, and in May of that year, by an Order in Council, the result in a great measure of Lord Macaulay's indefatigable exertions, the first step was taken towards the competitive system, provision being made for testing by examination and by subsequent probation the fitness of all candidates for the public service. There were many objections raised to the new mode; but eventually they were found to be futile, or to have been grossly exaggerated; the advantages of the new mode were conceded, and the principle was accepted as a basis for the conduct of examinations, although a nomination was still required in many cases. The success that attended the system of competitive examination as applied to the Civil Service of India, encouraged the Government to issue an Order in Council, June 4, 1870, by which the principle of open competition was formally adopted. Forty-five public departments were now thrown open to public competition. At the same time advantage was taken of the organisation of the Civil Service Commissioners to hand over to them the examinations for entrance to the army, which had also been placed under the same system, and which are now among the most severely contested of our examinations. By virtue of the Order in Council of June 4, 1870, the Civil Service clerkships were divided into two classes: Class I., with salaries from 100*l.* a year to 400*l.* a year; and Class II. with much smaller salaries—no attempt being made to equalise the salaries in the various departments. In 1876 fresh regulations were promulgated, on the recommendation of a commission presided over by Sir Lyon Playfair, by which public service clerkships were again divided into two classes: higher division and lower division clerkships. The system of competitive examinations runs much risk of being abused by the professional crammer and his allies; and the only way of checking the abuse is to keep in mind the fact that the examination has for its object the estimating of the power of the candidate, and that only. Experience has

formulated three useful rules in this connection. Restrict the examination to few subjects; ask only such questions as call for method in their answer rather than fact; ever have able examiners, who are acquainted alike with the subject-matter of the examination and the future work to be expected from the successful candidates. *See* LOCAL EXAMINATIONS and OXFORD AND CAMBRIDGE SCHOOLS EXAMINATION BOARD.

Experimental Science. *See* INDUCTION.

Explanation is either of terms or of facts. The first or logical explanation is the same as Definition. The second or scientific explanation has as its object to connect what is new and unknown with what is known. Scientific explanation concerns itself more particularly with pointing out the cause of a phenomenon. To explain a natural phenomenon, as the formation of dew, is to show by what agencies it has been brought about. In all such discovery of causes we connect the particular fact to be explained with what we already know. In other words, we bring the new fact under some general class of facts, and so apply to it a general principle. The same process of explanation is illustrated when we are able to deduce an empirical generalisation from some higher principle or law, as when the floating of wood and the sinking of metal in water are seen to be the necessary consequences of hydrostatic principles. (*See* EMPIRICAL METHOD.) In explaining facts to children we have to stop short of final scientific explanation, contenting ourselves with such partial explanation as is rendered possible by their previous knowledge. (On the nature of scientific explanation, *see* J. S. Mill's *Logic*, bk. iii. chap. xii.)

Expulsion. *See* LAW AFFECTING SCHOOLMASTERS.

Eye (Cultivation of).—The sense of sight is the first in point of intellectual importance. Through this we gain our most accurate knowledge of external objects. Not only so, it shares with hearing the distinction of being an artistic sense—i.e. a sense which is specially appealed to by the fine arts. The training of the eye is thus an important ingredient in intellectual education and in æsthetic culture. The exercise of the intellectual function of the sense concerns itself with the perception of the position of objects in space, of their magnitude, and of their characteristic form. It is now known that seeing things in their right place is not original, but is acquired by the aid of experience and the association of impressions of sight with those of touch. The educator may do much to render the child more ready and exact in recognising the distance and the real size of objects. The education of the eye concerns itself, however, more especially with training it to a nice and accurate observation of form. Here care must be taken to direct the attention of the child to the characteristic differences of lines—as straight, bent, or curved, vertical, horizontal, or oblique; then to the way in which lines are combined so as to produce what we call an outline or form, and more particularly to the relations of proportion. A fine observation of nature, as well as aptitude in all the nicer manual exercises, from drawing and writing upwards, depends upon an eye trained to the accurate perception of form. The other chief function of the eye, the discrimination and appreciation of colour, though of considerable importance as subserving knowledge, subserves in a still larger measure the gratification of the feelings. The ability to distinguish finely one colour from another, and to derive pleasure from colour, is one conspicuous element in the love of nature. In addition to this it forms a principal ingredient in what we call artistic taste, as employed not only about pictures, but about dress, household decoration, &c. Children vary much in the natural degree of their colour sensibility; but, save where there is a distinct organic defect amounting to colour-blindness, they may be led by a proper system of training to discriminate and enjoy colours. This system should begin by rendering the child familiar with the elementary varieties—viz. red, yellow, green, and blue—and then exercising him in discriminating the several sub-varieties of each of these, including the compound tints, as orange (i.e. reddish-yellow). Such discrimination of colours one from another should go hand in hand with the classification of like or related colours. Thus the child should be able, not only to distinguish the several reds, but to group them all under the general head 'red.' This systematic knowledge of colour implies a very carefully selected colour voca-

bulary such as we see employed by artists, dyers, &c. Since colour is more interesting to children than form, and the perception of it is much simpler, the education of the colour sense should precede to some extent that of the sense of form. A number of simple and agreeable occupations fitted to develop the colour-sense, such as singling out a number of different coloured objects, matching one colour with another, arranging colours in a graduated series, may be appropriately introduced into the nursery or infant class (cf. article PERCEPTION).

Eyesight is often seriously injured by school-work under unfavourable conditions. The *prolonged exertion of the eyes* which is involved in seeing near objects implies a strain of the accommodating apparatus of the child's eye (especially the ciliary muscles, which alter the convexity of the lens of the eye). This evil is commonly increased by badly arranged desks and seats, and by the scholar being allowed to read with his head bent over the book, and probably in a bad position for receiving the light. The eyes should never be allowed to come nearer than twelve inches from the book or slate; and if a scholar is noticed persistently to hold it nearer than this distance, a message should be sent to his parents that an examination of the eyes by an eye-surgeon is required. An *inadequate amount of light*, or an ill-directed light, is another cause of over-strain of the eyes. (*See* also LIGHTING.) The preparation of home-lessons in semi-darkness is a common cause of injury to the eyes. *Improper type* of reading and other books tends to produce the same result. Roman is much better than Gothic type, and the excess of myopia among Germans is to some extent ascribable to their use of the latter type. The thickness of up and down strokes, the spaces between letters and words, and between lines, and the length of lines, all require attention. If the letterpress is derived from a worn-out fount an imperfect impression of the letters is produced. The construction of such letters as *h* and *b*, *v* and *n*, should be especially precise. Pale ink and greasy slates are very trying to the eyes, and so likewise is a glossed paper. Maps should contain as few data as possible, and the lettering should not be too fine. (For further details see *School Hygiene*, p. 113: Sonnenschein.) *Needle work* in girls' schools is more trying to the eyes than any work boys have to do. In moderately fine linen, as a shirt-front, there are 120 threads to an inch; and as what is considered good work consists in taking up four threads—two in front and two behind the linen—this means working to $\frac{1}{60}$-inch. For drawing and needlework the best light is from above, and they should only be undertaken during the brightest hours of the day. The three most common defects of the eye in children are hypermetropia, myopia, and astigmatism.

Hypermetropia, or *long sight*, is a condition in which the eye is shorter from before backwards than usual, and therefore rays of light do not come to a focus on the retina, but behind it. Such children require to accommodate the eye (making the lens more convex) even for seeing objects at a distance, and for near vision the strain on their eyes becomes still greater. Consequently the eyes become inflamed, and the lids tend to stick together in the morning. The child often makes mistakes, and is thought to be idle, when really he is labouring under great difficulties of vision. The condition is often mistaken for short sight, because the efforts at accommodation are often excessive, and consequently the book is held nearer and nearer to his eyes. A convergent squint of the eye is sometimes produced.

In *Myopia*, or *short sight*, the eye is abnormally long from before backwards, so that rays of light tend to be focussed in front of the retina. The child holds his book near his eyes, in order to make the rays of light more divergent, and therefore more easily focussed on the retina. Myopia is distinguished from hypermetropia by the fact that distant vision is improved by a concave lens. If a person can see equally as well at a distance through a convex lens as without, hypermetropia exists. Hypermetropia is not due to school-work, though this may cause secondary troubles. Myopia, on the other hand, is increased, and sometimes caused, by school-work under unfavourable conditions.

Astigmatism is a condition of the eye in which the curvature of the cornea is not uniform, and therefore rays of light entering it at different meridians have a different focus. It is sometimes called 'slow sight,' and is a common cause of what has been called 'artificial stupidity,' which is quite remediable by skilfully applied glasses.

F

Factory Acts.—These Acts, the most important of which was carried early in the Queen's reign through the efforts of the seventh Earl of Shaftesbury, have had a most important influence upon education, inasmuch as their adoption was a recognition of the right of the State to step in between parent and child with a view to the promotion of the moral, intellectual, and physical well-being of the latter. The Education Acts were the necessary outcome of legislation for limiting the hours of labour of children and young persons. The series of statutes relating to such legislation were consolidated in the Factory and Workshop Act of 1878. Amongst other important regulations the Act makes provision for ensuring the attendance at school of children employed in factories and workshops. The Act defines a 'child' as any person under fourteen years of age, and a 'young person' as any person between the ages of fourteen and eighteen.

Faculty is commonly defined as a distinct and original power of the mind, by the action of which a particular class of mental products arises. The powers commonly known as faculties are the intellectual powers, marked off as perception, memory, imagination, and reason. The division of mind into such faculties marks the earlier stages of development of psychology, and is open to the objection that it resolves what is really an organic unity into a number of separate agents. Accordingly in recent psychology the attempt has been made to reduce the operation of the several faculties to more fundamental forms of activity. Thus, Dr. Bain gives as the three fundamental functions of intellect: Discrimination, Consciousness of Similarity, and Retentiveness. The familiar distinctions of the mental faculties are of great convenience to the educator, especially as they answer to successive stages of mental growth. (*See* DEVELOPMENT.) At the same time the educator should be on his guard against the error that the operations of different faculties are radically distinct from one another. It may be safely said that the whole theory of memory-training has suffered from the erroneous supposition that it is a faculty apart, whereas in truth the perfect training of it necessarily involves much that is commonly covered by the term observation, and not a little of what we mean by judgment. (*See* MEMORY.) Similarly, the training of the imagination and of the faculty of thought or reason has been too widely sundered by the educator. Rightly conceived, imagination is an essential preliminary process in thinking; and the training of the imagination, by giving the mind facility in separating and recombining its impressions, is preparing the way for the processes of abstract thought. (*See* Fleming, *Vocabulary of Philosophy*, 'Faculty'; Bain, *Mental Science*, Introd. chap. i.; Sully, *Teacher's Handbook*, p. 45 and following.) *See* UNIVERSITIES.

Fairy Tales and Fables. *See* FICTION.

Fear is an emotion of a disagreeable character, having a distinctly depressing effect on the energies of mind and body. It is the feeling of uneasiness and apprehension that arises in presence of a danger, i.e. a prospect of evil or suffering in some shape. It is an instinctive emotion, having its root in the impulse of self-preservation, which includes the tendency to shrink from what is painful. As such it shows itself in a distinct form very early in life, and is indeed one of the leading emotional features of childhood. It is held by some evolutionists that certain forms of fear—e.g. of big animals and strangers—which certainly appear within the first year of life, are the inherited results of ancestral experience. It is a moot point whether children have any instinctive fear of the dark. Fear takes one of two forms—that of definite apprehension of some known form of evil, as where the burnt child dreads the fire; and that of vague foreboding in presence of the unknown. This last enters into children's dislike of strange surroundings. It also has its place in a more disguised form in the childish feeling of awe before what is great or sublime. Their sense of inferiority to their elders in physical strength, knowledge, &c., favours the development of this feeling; and thus it may be said that childish timidity helps to sustain the attitude of reverence. From this brief account of the characteristics of the emotion

it may be seen that the educator's task in relation to it is not a simple one. On the one hand the child requires to be shielded from the miseries of fear in all its more intense and injurious forms. Nothing is more to be deprecated in the early training of children than a threat of any evil which, by its vastness and unfamiliarity, overpowers their imagination. They ought, too, to be helped to rid themselves of foolish and superstitious forms of fear by a sounder knowledge of things; and lastly, their extreme liability to fear, with its natural moral outgrowth of cowardice, should be corrected by a judicious exercise of the virtues of courage and endurance. (*See* COURAGE.) While, however, the educator has thus to repress and restrain fear, he must be careful not to undervalue it as a feeling subservient to the child's self-preservation, and promotive of the attitude of reverence and obedience. Foolish recklessness is almost as far removed from true courage as cowardice, and in boys of a certain temperament requires close watching. The most difficult problem, perhaps, in the educational management of fear is to assign it its proper place in moral discipline. Here it is the correlative of punishment, and an appeal to it is consequently implied in any system of government. At the same time the depressing and injurious effects of intense fear or terror clearly impose rigid limits on the use of the motive. In order to secure the disciplinary value of fear without these drawbacks we must be careful to avoid everything in the shape of harsh tyranny, and to threaten only such evils as are definite, and such as have a magnitude sufficient to deter, but not to frighten or overpower. (*See* Locke on *Education*, sect. 115; Bain, *Education as a Science*, p. 66; and Sully, *Teacher's Handbook*, p. 366.)

Fellenberg, Philippe Emmanuel de.—Swiss educationist, *b.* 1771, founded, with Pestalozzi, 'Agricultural Institutes' or schools where handicrafts, agriculture, and gardening formed the basis of the education of the labourer, in 1808, at Hofwyl near Berne. The Hofwyl establishment included also a literary institution, which dated from 1807, a normal school, 1809, and an intermediate or practical institution, added in 1827. He died 1844. (*See* ATHLETICS.)

Fellow.—This term signifies the membership of a learned society or of a college. At Oxford and Cambridge it is applied to a member of a college who participates in its revenue and government. Fellows are usually elected from the bachelors who have taken the highest degrees, but in some cases there is an examination for the Fellowships. At different colleges both at Oxford and Cambridge the Fellowships are held under varying conditions. As a rule, they are worth from 200*l.* to 250*l.* a year, with rooms and commons, and are tenable for about seven years. When a Fellow holds office in his college, he is permitted to retain his Fellowship after the prescribed term of years. Under the new statutes Fellowships are no longer forfeited by marriage.

Fellow-Commoners.—Generally the sons of noblemen or young men of fortune at Oxford and Cambridge, who pay a higher rate of fees, and are permitted to dine with the Fellows, and to graduate without examination. They are now confined to Downing College, Cambridge. (*See* 'University Snobs' in Thackeray's *Book of Snobs*.)

Feltre, Vittorino de. *See* RENAISSANCE.

Female Education. *See* EDUCATION OF GIRLS.

Fénelon (*b.* at Périgord, 1651, *d.* at Cambrai, 1715).—This distinguished French writer and theologian has a place in the history of education, as the author of a treatise on *The Education of Girls*, which he prepared at the request of the Duc and Duchesse de Beauvilliers, who, besides several sons, had a family of eight daughters. Fénelon also directed the education of the Duc de Bourgogne, and it was while thus engaged that he wrote several charmingly didactic works, including the *Recueil des Fables*, and *Télémaque*, which are still favourites with the schoolboys and girls not only of France, but of other countries.

Fiction.—Fairy tale and Fable, the delight of the childhood of men and nations, exert a powerful influence in the development of the intellect and the emotions, and in the formation of character, and consequently are indispensable aids to education. Not only poets in all ages, but other rulers in the empire of thought, the early Greek philosophers, the founders of religious systems, and even some of the great discoverers in science, have recognised the power of fiction as a medium for the communication of truth; and all

the great educational reformers—Locke, Pestalozzi, Froebel, Comenius—have recommended the judicious cultivation of the faculty to which fiction appeals, as essential to the healthy development of child-nature. 'As soon as a child has learned to read,' says Locke, 'it is desirable to place in his hands pleasant books, suited to his capacity, wherein the entertainment that he finds might draw him on, and reward his pains in reading; and yet not such as should fill his head with perfectly useless trumpery, or lay the principles of vice and folly. To this purpose I think *Æsop's Fables* the best, which being stories apt to delight and entertain a child, may yet afford useful reflections to a grown man, and if his memory retain them all his life after, he will not repent to find them there, amongst his manly thoughts and serious business.' Æsop, however, is but one amongst the enchanters with whose works it is desirable to familiarise the minds of children. Great care, however, should be taken in selecting works of fiction, that they are works of real enchantment, works constructed on those true artistic principles which lie at the foundation of a just conception of the humorous and the pathetic, the heroic, the beautiful, and the good. There will then be no danger of the child's reverence for truth being violated, even though the stories given him to read open up to him the vistas of fairyland, which can have no existence except in the imagination, and recount to him the marvellous adventures and occurrences which could never happen in actual experience. On the contrary, his love of truth will be fostered by such stories, which are revelations of the ideal, the only truly and permanently real. What we call the real passes away, in fact, is never existent for two moments together in the same state, but the ideal lives for ever. The real Homer, the real Shakespeare have trodden the road to dusty death, but the ideals of Homer and Shakespeare, the men and women they created, are immortal. It is possible, however, to appeal too much to the child's imagination, and by means of fiction to produce unhealthy excitement, which is injurious to the natural development of the moral and intellectual nature; therefore he should be discouraged as much as possible from the perusal of the sensational trash which Mr. Ruskin would place in his category of 'foul fiction,' and to which, unfortunately, schoolboys have had too ready access since the introduction of cheap printing and competitive publishing. Most of the periodicals now published for the special delectation of boys and girls belong to the 'foul fiction' class, and should be kept out of their way with as much caution as we would remove from them the temptation to imbibe ardent spirits.

Firth College. *See* PROVINCIAL COLLEGES.

Flaccus (Varius). *See* ROMAN EDUCATION.

Fletcher, Joseph. *See* YOUNG CHILDREN (EDUCATION OF).

Flogging. *See* CORPORAL PUNISHMENT.

Floor Space requires consideration in the construction of school buildings as well as cubic space. A very high ceiling will not compensate for deficient floor space. A space enclosed within four high walls and without a roof would, if crowded, speedily become stuffy and offensive. 'Lofty' and 'airy,' as applied to rooms, are by no means necessarily synonymous. Any height above 12 feet has but little influence on the purity of the lower atmosphere in which the children have to live; and even free cross ventilation near the high ceiling will not necessarily purify the lower atmosphere. The English Education Department give 80 cubic feet as the minimum space per scholar, and 8 square feet as the minimum floor space allowable. In the opinion of some sanitarians, however, this minimum is much lower than sanitary requirements demand. At least 15 square feet of floor space, it is urged, should be allowed per child, which, reckoning the height of the rooms as 10 feet, would give 150 cubic feet of space for each child. About 1,500 cubic feet of fresh air are required for each pupil per hour; therefore, with an allowance of 150 cubic feet of space, it is evident that the air must be replenished every six minutes, i.e. ten times in an hour. Such frequent replenishment of the air, however, is not successfully carried out in practice except in warm weather. (*See* ARCHITECTURE.)

Foreign Teachers. *See* TEACHERS.

Forestry.—Though nearly every other civilised State possesses one or more forest schools, there is in this country no or-

ganised system of forestry instruction in existence excepting in connection with the Indian Service; and even students for the forestry department of that service are required to visit one or other of the Continental forestry schools. The witnesses examined before the Committee of the House of Commons recently appointed to inquire into the subject, were generally and strongly of opinion that the establishment of forest schools, or at any rate of some organised system of forest instruction in this country, would be very desirable; but they differed considerably as to the best mode in which this might be effected. As regards the formation of a forest school, the Committee considered that more than one centre of instruction would be desirable; though in the first instance it might be well to establish one school only, in order to secure the most complete equipment, the best teachers, and a sufficiency of students. The Indian forest students, they thought, might constitute a nucleus. The Indian Government is already at some expense on their behalf, and it is probable that the fees from other students would nearly if not altogether repay any additional expense which their admission would entail. The school would doubtless be situated in England, but the Committee urged that a school for Scotland is also urgently needed, and were also of opinion that it would probably be desirable to found another in Ireland.

The following is a syllabus of the course of study at the School of Forestry at Neustadt Eberswalde, in Brandenburg. This is a superior school, all matters connected with the management of forests being taught theoretically and practically. The subjects are: The cultivation of woods and forests, forest taxation, political economy in general, and with special application to the administration of forests; history and literature of forest management, knowledge of game and gamekeeping, natural sciences in general, general botany, forest botany, the anatomy of plants, general entomology, special knowledge of forest insects, natural history of vertebrate animals in general, and of birds in especial; arithmetic and analysis with reference to matters occurring in the management of forests, geometry and trigonometry for the purposes of practical surveying, the mathematical principles of road-making, stereometry and mathematical geography, plan-drawing, mechanical physics, the forms of Prussian forest measurements, civil law with reference to the administration of forests and game, the protection and police of forests, chemistry, mineralogy, dynamical physics, and the physiology of plants. Two days a week are devoted to practical studies in the forests belonging to the institution, and in summer excursions are made daily for scientific studies and practice in surveying and levelling.

Form.—This word is used in the public schools of England to signify not only the bench on which pupils sit, but the class to which they belong. It is thus equivalent to the word 'standard' as used in the elementary schools. There are generally nine forms in the great public schools, but the number varies, and the order of precedence commences from the lowest number. Thus the first-form boys are those in the initiatory stage or lowest class.

Forster, Rt. Hon. W. E. *See* LAW (EDUCATIONAL) and SCHOOL BOARDS.

Fortbildungsschule. *See* LAW (EDUCATIONAL).

Foundlings.—Infants abandoned by their parents. The great charity in Guilford Street, London, known as the Foundling Hospital, which has an income of about 10,000*l.* a year, was originally established by private benevolence for the reception of such infants; but its benefits are now extended to poor illegitimate children whose mothers are known. The governors require to be satisfied of the previous good character and present necessity of the mother, and that the father (if living) has deserted her; also that the reception of the child will be the means of replacing the mother in the course of virtue.

France, Educational Law of. *See* LAW (EDUCATIONAL).

France, University of. *See* UNIVERSITIES.

Free Education.—The controversy known to our generation as the free education question dates from the introduction of the law of compulsory school attendance which came into operation by the Education Act of 1870, and was subsequently strengthened by the Education Act of 1876. Consequently, in this country the discussion has turned, not so much upon the general principle whether the cost of the education of the whole or a part of the child population should be

defrayed by the community, and only indirectly by the parent of the child, as upon the narrower ground whether—now that the State has decreed that the parent of a child shall cause it to attend a public elementary school, unless it is receiving elementary instruction in some other manner satisfactory to the local authority—it is or is not desirable to demand prepayment of a weekly school-fee from the parent towards defraying the cost of the education provided. Of course, those who have given in their adhesion to the general principle of free education, with or without compulsion—as the United States of America have, where compulsion has followed, and not preceded, free education, and has not even yet been adopted in the majority of the States—take their stand solely on social and political grounds; and, if they live in England, would doubtless consider the additional fact of compulsion in the light of an *à fortiori* argument in favour of their free-school views. But it is quite possible that many persons who reject the general principle of free education would be prepared to accept the particular application of it to a country which has introduced the principle of compulsion. These would take their stand more upon expediency—on the principle that a duty enforced upon individuals in the interest of the community should be performed at the cost of the community and free to the individual; or, more broadly, that 'free schooling is a particularly safe and useful form of public aid to the working classes.' Again, the arguments for free education, where the schools (secondary as well as elementary) attended by the large majority of the population—rich and poor alike—are free, will not serve entirely where the schools attended only by the poorer classes are free For, in the first case, the richer classes, who pay more in taxes, use the secondary schools, which cost more to maintain; and the poorer classes, who pay less, use the less costly elementary schools; and thus each class obtains an equitable *quid pro quo* for the educational tax. But, in countries where the elementary schools only are free, the richer classes, who do not use these schools, and yet pay the share of educational taxation based upon their means, receive no similar return for this outlay, and can therefore only be reconciled to the payment of this tax on other grounds than the 'fairness' of its incidence.

It follows from this that, if a comparison with foreign countries be instituted with the view of assisting the judgment on this question of free education as it affects England, a starting-point must be made from those countries which hold at this moment as nearly as possible the same position as England in regard to compulsory school attendance and payment of school fees. The next stage would carry the inquirer to a review of educational phenomena in those countries which at this moment possess what England would possess if the particular change desired by educational reformers were an accomplished fact. Now, in England, at the present time, elementary education is compulsory, but the elementary schools are not 'free.' In these respects England most nearly resembles Germany outside Berlin and other large towns, Austria, and some (if not all) of the provinces of Australia. If the controversy now raging were determined by the passing of a law requiring all schools aided by government grants (i.e. public elementary schools), whether further supported by local rates or voluntary contributions or endowments, to be open free of school fees to all applicants for admission, then this country would be working under similar conditions to France, except Paris and some other large towns, to Berlin and other large towns in Germany, and to some (if not all) of the provinces of the Dominion of Canada. But the parallelism is not nearly so complete, nor, therefore, the comparison of data so valuable, when we take Switzerland, or Paris and some other large towns in France, where education, secondary as well as elementary, is free; or the States of America, where this is also the case, and, in addition, some of them have a compulsory law and others not. Lastly, no argument at all can be derived from Holland or Belgium, as in both these countries education is neither compulsory nor free.

But there is one point in which England differs from every other country with which comparisons might be made, and that is in the existence of a large number of elementary schools, denominational or otherwise, under private management, which rank equally with the schools under the public management of School Boards as public elementary schools entitled to legal recognition and to a share of the

Government grant. Of the 3,438,000 children in average attendance in public elementary schools in England (in 1887), 2,187,000 or 64 per cent. were in Denominational Schools, 1,251,000 or 36 per cent. in Board Schools. But in no other of the countries named has the voluntary principle obtained such hold. Now a large majority of the supporters of these (so-called) Voluntary Schools in England have made up their minds that the adoption of free education would lead to the extinction of their schools, and, with this, of all guarantees for the religious education of the children in the principles of religion, as viewed from the standpoint of their several denominations. When, therefore, it is seen how large a hold the denominationalists in England have over the elementary education of the country, and how strongly preponderant, accordingly, is the influence of those who, on these grounds, look upon free education with disfavour, it is obvious that the problem of introducing free education into England assumes a much more difficult form than it could have assumed in France, Berlin, or Ontario, or would assume in Germany, Austria, or Australia. The introduction of free education into England has also been opposed on the general ground of its costliness. On the face of it, however, the adoption of this principle only implies a redistribution of an obligation now discharged by the parents of the individual children attending the schools, so that it shall in future be met, in the interests of the community by every tax-paying member of it. But, as a matter of fact, this comparison of the cost of the free system and the fee-paying system cannot be fairly made without taking into account the extra cost now incurred in enforcing compulsion *in the presence of the school fee*, not only directly, in the additional staff of officers required owing to friction and opposition, but indirectly, in the inadequate result, as measured by the lower average attendance compulsion is able to secure as compared with what it might secure if no school fee were demanded. This last is an educational loss, the magnitude of which is estimated very variously by educational experts; but if that loss should turn out to be great, and the country should awake to the fact, the advent of free education would not be very long delayed. It would then remain to be seen whether the sum lost in fees should be recouped to the several schools from the local rates or the imperial taxes, or in certain proportions from both; and, further, whether the denominational schools should be allowed to share in this additional endowment from public sources, and still retain all the privileges of private and irresponsible management now enjoyed by them.

French. *See* MODERN LANGUAGES.

Froebel, Friedrich Wilhelm August (1782–1852), was born at Oberweissbach, in the principality of Schwarz-Rudolstadt, in Thuringia. He is known throughout Europe and America as a strikingly original and scientific writer on the subject of the education of children during the earliest years, and as the inventor of the KINDERGARTEN (*q.v.*), or the institution in which children between the ages of three and seven are to be enabled to develop their faculties. It will be readily seen, however, that his theories and methods, based as they are on psychology or the science of the mind, are by no means limited in their application to the earliest years of childhood; nor were they so limited by him. We shall not attempt here any more than a plain statement of his principles; but one or two events and dates may be mentioned as important. Froebel studied under Pestalozzi at Yverdun (1808–10); published his principal work, *The Education of Man*, in 1826; opened his first Kindergarten in Blankenburg 1837—in the year 1840 (the four-hundredth anniversary of the invention of printing) this was changed into the Universal German Kindergarten, supported by a joint-stock company, and this is the year from which most Froebelians now date the movement; and published his *Mutter und Kose-Lieder* (songs, games, and stories for mothers to use) in 1843. Miss Praetorius established the first Kindergarten in England at Fitzroy Square, London, in 1854. The Froebel Society (London) was formed by Miss Doreck and others in 1874. In 1877 Miss Shirreff was elected president of this society.

The purpose of a Kindergarten, as briefly stated by Froebel himself, is as follows: 'To take the oversight of children before they are ready for school life; to exert an influence over their whole being in harmony with its nature; to strengthen their bodily powers; to exercise their senses;

to employ the awakening mind; to make them thoughtfully acquainted with the world of nature and of man; to guide their hearts and souls in a right direction, and to lead them to the Origin of all life and to union with Him.' His theory, and the principles on which his practice rests, start from the idea that human nature in a child—though liable to error and tainted by heredity—is in its primary elements as free from evil and falsity, as completely what it should be, as nature under every other aspect and in every other manifestation. He holds it, therefore, to be the mother's and the educator's task to endeavour to develop human nature's inborn original capacities and abilities by a carefully graduated progress in every direction. The child's nature being in its essence what we call good, what we have to do at first is merely to help its normal growth by securing for it a proper environment, and by supplying it with, and enticing it to use, the fitting means for the activities which its nature needs for development. Nothing that does not spring directly from the natural primary outfit of the child—is not a natural outcome of it—should be imported into the child in the first stage. There should be no prescription nor encroachment, no arbitrary interference—nothing but a loving, careful guidance under the direction of the broad general laws of human nature. To proceed: Froebel holds that in everything there is an eternal law which always finds its expression, with equal clearness, outwardly in physical nature and inwardly in the spirit, and also in the life (which is the result of the union of physical nature and spirit). Beneath this all-pervading, all-powerful law lies a single omnipotent cause—God. The spirit of God rests, lives, and works in nature, expresses itself by nature (as an artist expresses his spirit in a work of art), imparts itself through nature, continues to give itself shape in and by nature; but nature is not the body of God. The condition on which the existence and the development of things depend is their agreement with and likeness to this omnipotent cause—in their *God-like-ness*. This Godlikeness, or fundamental harmony with the laws of their being, rests in, rules, and operates in all things; all things live and develop through the Godlikeness which works in them; and the Godlikeness working in everything is the essence of the life of that thing. Therefore, the destination and vocation of everything is to develop, and fitly exhibit the essential principle of its being (its Godlikeness) to manifest and reveal God in the transitory visible world of things. The particular destination, the particular vocation of every perceiving and reasoning human being is to develop his individuality, his essence—*to become himself*; to grow fully conscious of, to win a vigorous and clear insight into his Godlikeness, so as to develop it in practice in his own life, of his own free will and desire; to make it effective in every direction which his inner capacity admits of. To awaken a human being to a full sense of this, and to provide him in unbroken continuity with the means for putting it into practice, is to *educate* man. Froebel, like Pestalozzi, holds that wherever there is life, wherever there is development, there must be motion, activity- that development is only to be produced by exercise. A part, therefore—a large part—of education must consist in active original endeavour, active original work, which compels the child to use its own faculties. Education cannot consist of mere listening and imitation.

According to Froebel, from its first breath the child comes under the influence of three powers: viz. Nature, animate and inanimate; Humanity; and the Power which pervades and directs these—rising to its highest temporal manifestation in the latter—the power we call God. The child's *body* connects it with organic and inorganic, animate and inanimate, nature; its *heart and mind* connect it with and make it a part of the great whole, humanity (past, present, and future); and its *whole being and soul* depend upon and are energised by God. If this be so, the child, he thinks, should grow up under the influences of nature; there it should gradually, but in unbroken continuity, learn that laws underlie all organic formation, and that conformity with those laws is the fundamental unvarying condition for all true and every-sided development towards perfection; should come to see gradually that all these laws are in reality but various modes and manifestations of one law, and thus learn to link together or reconcile what seems separate or opposed; should, through the loving care it bestows on plants and animals, enlarge its heart and sympathies, and prepare it-

self for the loving care it is to bestow on human beings; should, in studying and imitating the conformity of His works, find and love the great Master as the Creator of nature, and its own Creator; should breathe in the peace which rules in nature, and in occupations connected with nature, before the noise of the world and of sin enter its being.

The means that nature chooses for the development of a child's body is physical movement. Therefore, let the limbs be carefully exercised—especially the hand, and with it the sense of touch. The instinct of construction and the senses of sight and hearing should next receive attention and be exercised. The occupation of gardening should be fostered, for by it the child gains his first glimpses of the wonders and beauties of nature; learns to love labour and to use labour for the pleasure and good of others. To lead the child from nature to humanity, his inborn social impulses should be drawn out and kept livingly active. In short, every spontaneous development which the child's nature makes a demand for should be assisted and directed in one unbroken continuity, and with the greatest care and caution.

On the practical side, the master-stroke of Froebel's genius was his organisation of children's play. He recognised it as the means nature herself had chosen for the education of the young. He saw that by exercising a wise and thoughtful choice of games, and organising them, he could, without in any way spoiling the spontaneous delight, make them the means by which his ideas of education might be put into practice in their first and most elementary forms. Games of movement for the limbs, for the hands, of construction, of childish song—all these might well be collected or invented; and these he did collect or invent with admirable success. The games and songs will be found organised and explained in the *Mutter und Kose-Lieder*. The implements for the exercise of the intellectual faculties form what are called 'Froebel's Gifts.' The employment of the games, songs, and gifts is what is called the *Kindergarten System*. Gardening—nature's own most delightful game—and the care of animals did not require his invention. All he had to do here was to encourage and lead the children to make use of the results of their infant efforts in the service of others. This would draw them to their fellows, would link them to humanity; and from love of their fellows would be developed the love of God. Work, which at the same time was the fulfilment of duty, he saw was the only true basis of moral culture; but it was necessary that such work should not only delight the worker, it should also satisfy his instinct of love; it should therefore have an object; and that object should be to give help and pleasure to others.

Furniture.—The furniture required for an ordinary class-room is as follows: (*a*) desks and seats for the pupils; (*b*) teacher's desk and seat; (*c*) a cupboard; (*d*) a blackboard; (*e*) a bookcase for teacher's books; (*f*) a clock. The best desks for pupils are single desks placed eighteen inches apart and occupying about two-thirds of the floor space. The seats should be slightly hollowed, and capable of being raised or lowered; and the backs should slope slightly backwards, and should be alterable so as to give their chief support just below the shoulder-blades of the pupil. There should be a rest for the feet somewhat in front and sloped upwards so that the fore-leg may rest comfortably at an angle of about 60° The lid of the desk should slope towards the pupil; and its lower edge should come to his elbow and be vertically over the front edge of the seat. The lid should be twenty-four inches wide, and have a hinge about one-third of the way up from its lower edge, so that this part may be turned back and used as a book-rest, and may also give the pupil room to stand freely. The box part of the desk should not extend towards the pupil farther than this hinge, and should be capable of being raised or lowered. The ink-wells should be provided with covers. If dual desks be used, a slightly larger number of pupils may be seated in the same floor space. The teacher's desk and seat should be placed on a broad platform raised about nine inches from the floor. The desk should be provided with drawers on the left hand, and a cupboard on the right. Probably, the most serviceable blackboard is one made of wood, and divided into two parts, which can be moved up and down like the sashes of a window. Each part should be about six feet by four feet. Its most convenient position is either immediately behind the teacher's seat, or on

the same wall, somewhat farther to the right of the teacher (when seated). Fixed to the wall, close to the teacher's desk, there should be a small bookcase (with glass door, and lock and key) to hold his books. The cupboard should be large enough to hold all the apparatus of reading-books, stationery, &c., usually required by the class. As a rule, its dimensions should be seven feet high, by four feet broad, and sixteen inches deep. The shelves should extend from the left side three-quarters of the way across; the other quarter being left for the storing of maps and other apparatus whose length would otherwise prove inconvenient. Hooks should be fixed on the top of the blackboard frame for the hanging up of maps, &c. There should be a few pictures on the walls to give the room greater cheerfulness and interest. The subjects of these pictures should be either historical, or some scenes or figures of natural beauty, their object being to charm rather than to instruct.

G

Gall, James. *See* EDUCATION OF THE BLIND.

Games. *See* ATHLETICS.

Generalisation. *See* ANALYSIS.

Geography.—The inquiry into the state of geographical teaching in English schools, instituted a few years ago by the Royal Geographical Society, which resulted in Mr. J. Scott Keltie's excellent report of 1885, proved what few masters doubted—that geography was little taught (except in elementary schools), and that little badly. At the best, children are made to commit to memory a vast amount of statistics—most of which are of no general value; and not a few of no value whatever. The whole plan is a failure. It is with the hope, therefore, of helping a much needed reform that the following plan is described. The first stage is to train the constructive imagination of the child; to enable him to form mental pictures of what he has *not* seen by means of that which he *has* seen. The first step, therefore, is to exercise the child in observing his own natural surroundings, and the simplest and commonest natural phenomena. When he has observed carefully a rivulet, a mound, or a sloping piece of ground, we may lead him, by the aid of exercises in relative magnitudes, to imagine a stream or river, a mountain, a sloping plain or watershed. By the aid of rough models, photographs, and verbal descriptions we may then enable him to form *mental pictures* of particular places and localities which he has not seen. No doubt the best plan is to see a place with one's own eyes; to travel in it and examine it. But this is only possible for a very few. The generality must depend on the pictures and descriptions of others. What the teacher has to do is to make sure that these pictures and descriptions are clearly understood, and result in *mental* pictures; that the learner knows how to use them. Maps are of no use here, for they help the imagination very little indeed. The time for learning about them and using them comes later. What are needed are pictures (or, rather, photographs) and rough models. The teacher, however, has one great difficulty to contend with at first: viz. that children do not care for still life and scenery. It is hard to get them to observe still life even when it is present. They are still less anxious to *imagine* it. What they care for is *moving* life, action, adventure. A place is interesting because of the living acting men or animals that have been or are in it. Put a British soldier in the Soudan and every one of us is interested in the desert, and eagerly studies every picture and every description of it. We must, therefore, make the locality which we are to mentally picture, in the first place, *interesting*. We can do this by stories, adventures, travels, historical events—especially those in which the physical aspect and conformation of the locality are of *real* importance (as in battles, for instance). Having acquired some idea of the real character of a locality, our next step will be to deduce and note the bearing of this on ordinary human life and industry, and the bearing of human life and industry on the locality. Pictures will still help us when we pass on to towns, and buildings, and industries, as well as for plants and

animals. How this may then gradually branch out into *physical*, *industrial*, and *political geography* we need not describe.

It is when forming mental pictures of an unseen locality that the first need of a map is felt—something to write and record the parts and details which we have learnt to see with our mind's eye. Here, then, we should begin to inquire how to make a good record or memorandum of a scene not present—something more handy and comprehensive than a picture. We shall begin with some simple thing actually present. By drawing the vertical outline of the door or window of the room on the blackboard, and discussing it, we may arrive at the idea of relation of parts or *drawing to scale*. By drawing the horizontal surface of the table we arrive at an idea of the necessity of fixing some side of the board to represent some side of the room; and by trying to insert on our blackboard plan some of the objects on the table, we arrive at ideas of *relative positions*, *relative directions*, *distances*, and *areas*. We may then draw plans of the playground, or the neighbouring fields (introducing the idea of *points of the compass*), and study carefully a *local map*. Turning next to spheres, and trying to copy on to a blackboard sphere what is on another, we may arrive at the use (in the case of an oblate spheroid) of the equator, and the ideas of latitude and longitude. [With proper arrangement the sphere may be made to *become* oblate by spinning it on its axis.] Returning to drawing on the flat we may pass on to inventing the marks for mountains, rivers, trees, &c. (as on the geological survey maps), and so to map reading, and the maps of the localities of which we have been forming mental pictures.

Limited space makes it impossible to describe the details of the plan fully; but enough has been said to suggest them. Photographs are more faithful in small matters than pictures, but to collect them takes time. Of *pictures* there are several good atlases published in Germany. The two best are Hirt's *Geographische Bildertafeln* (published at Breslau, 7*s.*), and Schneider's *Typen-Atlas* (Dresden, 2*s.* 6*d.*). A set of eight large coloured pictures of Holland are supplied by its government to its public schools; these can be procured in England for about 4*s.* Many large wall pictures of localities and towns were exhibited at the Royal Geographical Society's Exhibition of 1885, and are mentioned in their catalogue.

Geodesy. *See* MATHEMATICAL GEOGRAPHY.

Geology.—Geology bears to Geography the same relation that the anatomy and life-history of animals does to their morphology. Some knowledge of the former, in its broad outlines at any rate, seems essential to the latter; hence, there is much to be said for the introduction of a short course of geology as a part of the general instruction in geography. The description of the vertical contours of a land-mass (what has been aptly called by an American writer 'structural geography') is incomplete until the skeleton is laid bare, and the cause of the surface forms shown. Thus, in England, the general dip of the secondary strata towards the Eastern coast, and the denudation of their outcrop in the midland regions, explain the position of the watershed of this country and the insignificance of its height; hence the direction and character of the rivers and other geographical facts dependent upon these.

Apart from its bearing upon geography, geology claims a place in the school curriculum for its own sake. It is one of the 'sciences of observation,' and, as such, develops this faculty in the pupils in a manner that linguistic and mathematical studies cannot do. To this end the teaching must be objective in character, the number of the facts imparted being of far less importance than the method in which they are presented. Dr. Whewell, insisting on the value, as a mental discipline, of the exact and solid study of some portion of inductive knowledge, as botany, geology, &c., proceeds: 'But I say, the exact and solid knowledge, not a mere verbal knowledge, but a knowledge which is real in its character, though it may be elementary and limited in its extent. It must be a knowledge of things, and not merely of names of things, an acquaintance with the operations and productions of nature, as they appear to the eye, not merely an acquaintance with what has been said about them—a knowledge of the laws of nature seen in special experiments and observations, before they are conceived in general terms—a knowledge of the types of natural forms, gathered from individual

cases already familiar. By such study of one or more departments of inductive knowledge, the mind may escape from the thraldom and illusion which reigns in the world of mere words.' In order to carry out these ideas, the teaching of this, as of every other natural science, must take into account (1) the objects dealt with; (2) the naming of these objects; (3) their relations. What exists must first be known, their names and connections. It will not be sufficient to give tables of strata, explanations of geological terms, or even to exhibit fossils. The first stage should enable the pupils to gain a first-hand acquaintance with the chief materials of the earth's crust, to learn to recognise granite, limestone, &c., &c., to see for themselves that water does not run through clay, and that it does permeate chalk and sandstone. Afterwards, a description of the agencies that have brought these things to their present condition, and of the nature of the evidence furnished by fossils, will be intelligible and interesting. As full an account as possible of the geology of the surrounding district will best illustrate this stage of instruction. Later will follow a more general account of the great rock-formations, of their characteristic life-forms, and of the localities where they have been studied.

Every school should be provided with a cabinet containing specimens of the rocks of different strata, another of the most striking minerals, another of characteristic fossils; though the two last are of less importance than the first. Diagrams will also be needed to illustrate geological principles; but the instruction given in the schoolroom must be supplemented by out-of-door observation on the part of the pupils, and the specimens of rocks and fossils brought by them from neighbouring quarries and railway cuttings will be of more value educationally than the cabinet specimens.

If the school possesses, as it should do, a Natural History club, the members should be encouraged to write descriptions of the specimens found, and of the locality in which they were found, to be read at their meetings. This will encourage independent observation out of school. Occasionally the teacher may take his class to some neighbouring height, and describe the agencies that have moulded the surrounding district, with the results before his pupils' eyes.

The bearing of this science on geography will thus be made clearer, and a flood of light will be poured on the whole subject.

Local museums must also be brought into requisition, and if one does not exist in the town where the school is situated, arrangements should be made for a visit of the class to the nearest. Where a museum exists, some persons will generally be found who have made the science or sciences illustrated in it their special study, and who, on the occasion of such a visit, will be ready to make their general or local knowledge available to render it as interesting and profitable as possible.

Geology has a practical as well as a theoretical side, and this should not be altogether disregarded, especially if it enters into the instruction of elementary schools.

It is the soil which furnishes useful minerals, and materials for building and many other industries; hence the study of the nature, properties, and locality of these substances must be profitable to those whose future work will consist in turning them to the best account. Even if want of time excludes from the school the systematic study of geology as a science, it will be an advantage for the teacher to have an elementary knowledge of the subject. This is recognised by the French Code of 1882, which provides a course of geology at the Normal Colleges for the students in training during the third year; and it would be well if the example were followed in other countries.

Besides English text-books, as Geikie's, Jukes', and others, Dana's *Manual of Geology* (American) will be found useful.

Geometry.—Two questions naturally suggest themselves in connection with the educational aspect of geometry. First, what are the purposes to be served by studies in geometry? Secondly, what does a complete course of geometry include, and how, and in what order, are the various parts to be studied? The answer to the first question is not far to seek, and there is little or no difference of opinion amongst educators with regard to it. We teach some subjects for the practical use of the facts or the skill they impart; others for the mental discipline they afford. We teach geometry for both reasons—for the

sake of the habits of mind which this study has a tendency to form, and for the practical use of the results of its investigations. Now, what are the habits of mind which it tends to form—which it either strengthens or creates?

First, the study of geometry develops the power of attention. It makes the mind able to direct itself to any question that may be proposed; to give that question continuous thought; to compare it with other questions, and to fix its relations to them. It enables us to regulate the succession of our thoughts. In other words, it develops the power of continuous reasoning. This power has to be acquired; it is not given by nature. To learn to reason, something must be given to reason upon. Of the many possible subjects, it is clearly desirable to choose that class of subjects in which we can find out by other means than pure reasoning, such as measurement and ocular demonstration, whether the results of the reasoning are true or not. Geometry fulfils these conditions better than any other subject, and has in consequence, for many centuries, been used as the instrument for giving practice in reasoning. The truths of geometry are simple, easily tested, and capable of exact statement. Reasoning on them may be built up like a chain, link by link, and at every step is coherent and conclusive. Again, we study geometry for the use of the facts it teaches in building constructions, in manufactures, and in all the mechanical businesses of life. Every fact, from the most elementary to the most advanced, has myriads of practical applications. We teach geometry, then, as we teach other sciences, for its direct effect on our well-being in its practical uses, and for its higher but more indirect effect as a discipline of the intellect. The two objects should be sought together. In answering the second question we have no doubt as to the beginning. We commence with Euclid's *Elements* or some equivalent system of elementary geometry. The famous *Elements* for twenty-two centuries have been the inspiration and aspiration of scientific thought. The book was written shortly after the foundation of the Alexandrian Museum, and, therefore, after the science of mathematics had burst the bonds which restrained her in the Platonic school, and had started on her career of conquest over the whole world of Phenomena. It consisted of reliable knowledge which was moulded into form so nearly perfect that every scientific student of every subject took it as the model after which he sought to shape his own particular science. 'Far up, on the great mountain of Truth, which all the sciences hope to scale, the foremost of that sacred sisterhood was seen, beckoning to the rest to follow her. And hence she was called in the dialect of the Pythagoreans, "the purifier of the reasonable soul"' (W. Kingdon Clifford). This book of Euclid's has had a history as chequered as that of human progress itself. It embodied and systematised the truest results of the search after truth that was made by Greek, Egyptian, and Hindoo. It presided for nearly eight centuries over that promise of light and right that was made by the civilised Aryan races on the Mediterranean shores. It went into exile along with the intellectual activity and the goodness of Europe. It was taught, and commented upon, and illustrated, and supplemented, by Arab and Nestorian, in the Universities of Bagdad and of Cordova. From these it was brought back into barbaric Europe by terrified students, who dared tell hardly any other thing of what they had learned among the Saracens. Translated from Arabic into Latin, it passed into the schools of Europe, spun out with additional cases for every possible variation of the figure, and bristling with words which had sounded to Greek ears like the babbling of birds in a hedge. At length the Greek text appeared and was translated; and, like other Greek authors, Euclid became an authority. But the question is constantly being asked whether the elements form a suitable book for beginners. On the one hand it is urged that Euclid's book was never designed for beginners, that Euclid's object was to show how little need be assumed in geometry, and how much that is obvious as well as obscure may be demonstrated, and that, too, under difficulties which are never encountered, and in spite of restrictions which are never imposed. It is urged that the teacher in this, as in other subjects, should always take advantage of the many simple and incontestably true notions already in the pupil's possession, and should proceed without delay to the all-important part of the subject: the passage, with absolute certainty and in the most direct and simple manner, from.

geometrical properties which are obvious, to others which are less obvious or not at all so. The progressive character of the science is also quoted, and it is pointed out that elementary geometry can no longer be regarded as a long since perfected branch of knowledge; it is no longer classed with the seven orders of architecture, for instance, that cannot be touched without being spoilt. On the contrary, it is generally recognised now, that the elements of geometry, so far as principles and methods of exposition are concerned, constitute not a dead but a living science, susceptible still of being improved, and still capable of furnishing new matter for thought to both teacher and student.

On the other hand, the advantages of uniformity are urged in favour of the retention of Euclid as a text-book. Every examiner in the subject finds that the inconvenience of departing from Euclid is a very serious one, and plunges him at once from order into chaos. Many propositions have their converse, and unless the examinees follow the same system it is almost impossible for an examiner to frame his questions so as to prevent their making false use of the conversion of propositions. For instance, the fifth proposition of the First Book may be based on the sixth; the forty-seventh proposition may be offered as the converse of the forty-eighth; and, in fact, if absolute freedom of choice be allowed with regard to the system of geometry used, the result will be a medley of portions of different systems, which will be useless for the purpose we have described in answering the first question. What, then, is the course which should be adopted in this dilemma? Common sense suggests a compromise. In the teaching of the subject the way may be smoothed by explanation, by investigation, and by the postponement of difficulties until they can be grappled with. It seems wise to adhere as far as possible to the order of Euclid for the sake of the common standard which this furnishes for examination purposes, but no examiner should insist on non-essentials. For instance, Propositions II. and III., and probably VIII., are quite unnecessary. The solution of the difficulty will be completely met by a freer method of teaching on the one hand, and in examining by a judicious avoidance of those parts which arise from the arbitrary and unnecessary restrictions imposed by Euclid, and which may be omitted without loss of rigour as regards the remainder.

The superiority of this mode of procedure for educational purposes over that of keeping to the dry text of Euclid pure and simple, will be contested by no one who has observed either the permanently pernicious effects of the discouragement produced by initial vagueness, tediousness, and difficulty, or the permanently beneficial influence of the encouragement arising from early successes, and from the fulfilment of the pupil's natural expectation that every intellectual effort will be followed by a conscious acquisition of knowledge. To secure and sustain the pupil's interest from the first is also a point of unquestionable importance; and although personal qualifications in the teacher are here indispensable, this end is undoubtedly promoted by a method wherein difficulties are judiciously tempered to the pupil's capacities, and the subtleties of the subject to his powers of appreciating them.

It has been urged, and not unreasonably, that by thus rendering geometry more accessible its value as an intellectual discipline may be impaired. This, however, is by no means nccessarily the case. Intellectual discipline is the natural concomitant of accurate reasoning, in geometry as in every other subject; and accuracy of reasoning depends essentially upon the well-marked distinction maintained at every step between assumption and consequence, and upon the manner of making the passage from the former to the latter. It cannot be said to be impaired by omitting to demonstrate when demonstration is not necessary to conviction, or by postponing inquiry into the relation which may possibly exist between equally incontestable elementary assumptions.

The higher parts, that is to say the parts beyond Euclidian geometry, take two distinct courses, proceeding according to two perfectly distinct methods. One is called analytical, algebraical or co-ordinate geometry, and the other is the so-called higher pure geometry. Little need be said of the former beyond the fact that as regards the treatment of the branch included under the term 'conic sections,' or curves of the second degree, there are two methods—one followed in

Todhunter's *Conic Sections*, and the other in Puckle's (or Salmon's). Now, experience seems to show that a joint and simultaneous study of both is preferable to an exclusive but exhaustive study of either.

The higher pure geometry includes what is called in England 'geometrical conics' (i.e. conics treated by Euclidian methods), and a larger branch intimately connected with the former, which has been but little cultivated in England, although it was long since introduced into science by the illustrious geometers Poncelet, Möbius, Steiner, Chasles, and Staudt, and systematised in text-books by Schroeder, Reye, and Cremona. This branch is widely cultivated with great profit on the Continent, but is feebly represented even at the universities in England. It is true that it has been well taught at Oxford by the late Savilian Professor of Geometry and a few others, and attempts have been made to give it a footing at Cambridge; but these efforts have neither been thorough nor extensively appreciated, and they have not been supported in the public schools. This fact is often ascribed to a too slavish adherence to *Euclid's Elements*, and to the custom here of treating that book as the omega as well as the alpha of the science. This branch of geometry includes amongst its elementary notions that of the projective correspondence of the points on two lines or two planes, and of the rays of two plane pencils or of two pencils in space. We are introduced by it to that special kind of correspondence known as involution, which has lately assumed importance on account of its applications in physics. The notions of this geometry lead naturally, and with marvellous facility, to a comprehensive grasp of the properties of *conic sections*, and a more general familiarity with them would dissipate the disorder and contradiction which exist in the treatment by different authors of geometrical conics. It will be seen that we have not given a distinctive name to this branch, and the difficulty of selecting a title will appear from the following quotation from Cremona's preface. Having pointed out that most of the principal propositions in his work owe their origin to mathematicians of the most remote antiquity, and may be traced back to Euclid (285 B.C.), to Apollonius of Perga (247 B.C.), to Pappus of Alexandria (fourth century after Christ), to Desargues of Lyons (1593–1662), to Pascal (1623–1662), to De la Hire (1640–1718), to Newton (1642–1727), to Maclaurin (1698–1746), to J. H. Lambert (1728–1777), &c., he continues: 'The theories and methods which make of these propositions a homogeneous and harmonious whole it is usual to call *modern*, because they have been discovered or perfected by mathematicians of an age nearer to ours, such as Carnot, Brianchon, Poncelet, Möbius, Steiner, Chasles, Staudt, &c., whose works were published in the earlier half of the present century.'

Various names have been given to this subject. The title 'higher' is sometimes used, but the things for which this adjective at one time seemed appropriate may to-day have become very elementary; that of 'modern geometry' (*neuere Geometrie*) in like manner expresses a merely relative idea, and is open to the objection that although the methods may be regarded as modern, yet the matter is to a great extent old. Nor does the title 'geometry of position' (*Geometrie der Lage*) as used by Staudt seem a suitable one, since it excludes the consideration of the metrical properties of figures. The name of 'projective geometry' seems to express the true nature of the methods, which are based essentially on central projection or perspective. And one reason for this choice is that the great Poncelet, the chief creator of the modern methods, gave to his immortal book the title of *Traité des Propriétés Projectives des Figures.*' (*See* MATHEMATICS.)

Gerando, Marie-Joseph, Baron de (*b.* at Lyons, 1772, *d.* in Paris, 1842), was the son of an architect. His mother was a woman of rare order of mind. As a boy, however, Gerando was considered dull. At the age of sixteen he was stricken with a severe illness, and vowed to consecrate his life to God. He subsequently joined the seminary of St. Magloire in Paris. This he left at twenty, and came out as author on behalf of religious tolerance. In 1793 he was wounded and taken prisoner, and on being set free he returned to Paris; but owing to the proscriptions he fled to Germany, and there he wrote his first philosophical work. On his subsequent return to France Napoleon made him a councillor of State, and he devoted his energies to the cause of popular education. In 1815 appeared his eloquent report on 'Schools for the Poor.' This roused public sympathy, and led to the formation of the 'Society for

Elementary Instruction.' After this had achieved signal success and schools had sprung up everywhere, Gerando lent his vast power to education in many ways. In 1819 he introduced singing into the schools of the society. He was one of the founders of the first savings bank. He co-operated with Cochin in establishing the first infant school. He had no small influence in aiding Abbé Sicard by his work on *The Education of the Deaf and Dumb*. Gerando was a most enthusiastic and industrious worker, and his works, collected and completed, are published in eight volumes.

German Universities. *See* UNIVERSITIES.

Germany, Educational Law of. *See* LAW (EDUCATIONAL).

Giffard Lectures. *See* PRELECTIONS.

Girard.—Next to Pestalozzi, Jean Girard—or, as he is more commonly called, 'Le Père Girard'—is undoubtedly the most eminent sc' oolmaster and educational reformer whom modern Switzerland has produced. He was born at Fribourg in 1765. Most of his active and kindly life was spent in that town or at Lucerne, either in teaching in the schools and in reforming popular education, or in work connected with the Franciscan Order to which he belonged. He died at Fribourg in 1850. His best known works are *L'Enseignement régulier de la Langue Maternelle*, published at Paris in 1844; and his *Cours éducatif de la Langue Maternelle*, the last volume of which appeared in 1846. These books have had a great and lasting influence both in Switzerland and in France. The method they so ably set forth is distinctly an inductive and practical one. Instead of beginning with the learning of grammar—the generalities and abstractions of which Girard held to be beyond the comprehension of children, and therefore wholly uninteresting to them—the first step is to ascertain what language the children habitually use to express their own ideas, and to rectify and enlarge it as far as is then and there necessary for the children in question. Starting from this, the children are gradually familiarised with the way in which words are used in sentences to express ideas—both by being helped to examine simple sentences already made, and by being induced to make statements of their own. In the former case they may be given all but a noun or a verb, &c., and required to supply a word which will make sense; or they may add adjectives, adverbs, &c., to a simple sentence so as to make the meaning more clear or more full, and thus learn the value of each word in a sentence. From this they may gradually proceed to compound and complex sentences, and to phrases. In the latter case, when the children make statements of their own, they are only required to speak and to write of what has actually come within their own experience. They should begin quite simply with such a statement as 'a bird sings;' and then go on adding to the statement, as: 'a little bird sings,' 'a little bird sings in the garden,' 'a pretty little bird sings sweetly in the garden every morning;' and so on. Difficulties are to be introduced very gradually. Rules are to be arrived at by the children themselves—not complete rules all at once, but rules which gradually grow more complete as experience widens. Even the conjugations of verbs are not to be introduced in complete elaborate paradigms; but bit by bit as they are wanted. The object of the plan is to enable children to read with perfect intelligence, and to speak with perfect intelligence, clearness, and accuracy. For this purpose, Girard maintains that what we want is not codified, ready-made rules, but copious, well-chosen examples, and constant practice in making other statements like them. In the later stages, the grammar is used as a book of reference in which is to be found a careful, clear statement of the results of experience. For more details we must refer the reader to the books themselves—they are well worth study.

Girls (Education of). *See* EDUCATION OF GIRLS.

Girls' Public Day Schools. *See* EDUCATION OF GIRLS.

Girton College. *See* EDUCATION OF GIRLS.

Gleim, Betty (*b.* at Bremen, 1781, *d.* 1827), was a distant relative of the poet Gleim, and the daughter of a merchant at Bremen. She was interested in questions of education early in life, and in 1805 she established a school for young girls in her native town, which she conducted with great success for ten years. In 1815, in order to extend her knowledge of educational subjects and methods, she left Bremen and visited Holland, England, and

some districts on the Rhine. Upon her return, she reopened her school, and continued the mistress until her death. She wrote several works—one of which, entitled *The Education and Instruction of Woman*, is regarded as a classic in Germany. The second volume treats of the method of Pestalozzi, which she adopted in her school. She has unfolded his method with remarkable lucidity. She also wrote a second work on education of women, entitled *What has renewed Germany the Right to expect from its Women?* 1814.

Goethe, Johann Wolfgang von (*b.* at Frankfort-on-Main, 1749, *d.* 1832), has so far dominated German thought that any statement of his on education is of the highest interest. His father was a man in comfortable circumstances, though of no great position in society. Yet he had a great love for literature, and great taste in art, so that he exerted a powerful influence on the desires and character of the young poet. Goethe is said in his *early* years to have had anxious thoughts about religion, and before he was eight to have devised a form of worship to the 'God of Nature.' He entered the university of Leipzig at the age of fifteen. Here his poetical turn first showed itself in a pronounced manner; and though his father designed him for jurisprudence, instead of studying law he tried to find some satisfactory theory of poetry. German literature was simply in its infancy, and he could find nothing to his taste. Here, however, he began one of the habits of his life, viz. to turn everything that pleased or pained him into verse. He also paid some attention to the history of the fine arts, and even took to etching; but this impaired his health, and in 1768 he left Leipzig. To recover his health he was sent to the residence of a lady named Klettenberg, the 'fair saint' of 'Wilhelm Meister.' She was a mystic, and exerted a lifelong influence on the poet's character. When he left her, and went to Strasburg to finish his legal studies, he neglected them and pursued anatomy and chemistry. Here he met with Herder, who advised him to study the Italian poets. On his return home, he produced *Götz von Berlichingen*, 1773, and a novel, *Werther*, 1774. This latter fairly took Germany by storm, and Goethe's fame was made. He was introduced to the Duke of Saxe-Weimar, where he went to live, and when the duke came into possession of government he bestowed every possible honour upon Goethe. There the poet lived for many years. He had complete control over the theatre, and produced the best works of Schiller on the stage. He was surrounded by the most refined and literary society of his time. He was made a privy councillor, and afterwards travelled in Switzerland and Italy for a long time. Meanwhile, he was constantly producing those great works which, for their power and variety, have placed him at the head of German literature. His drama *Hermann und Dorothea*, and his novel *Wilhelm Meister*, show us his views on education, though his principles are only scattered here and there, and not worked out into a cut-and-dried method. To him, education was an evolution—drawing forth from the individual that which was best—'the realisation, as completely as possible, of the general type of the species.' His great motto was 'In the beginning was action': therefore, he ever urged 'Do, and by doing you will attain to your highest and best.' In the education of infants as in the government of nations, he thought nothing more futile than repressive measures. 'Man,' he says, 'is naturally active: open a way for action, and he will follow you.' He says much to this effect, and reiterates that 'negative discipline is powerless.' We recognise in all this at a glance much that stamped itself in Carlyle, who found in Goethe a mine of riches. In *Wilhelm Meister* we have something like an educational Utopia, especially in book ii. Mr. Carlyle translated *Wilhelm* early in his career, and a most amusing review of the translation is found in De Quincey (Works, vol. xii.). De Quincey did not find (probably did not look for) the lofty principles of 'the mute system of education,' which Goethe then displayed, and which so delighted Carlyle. The first of these lofty principles upon which Goethe insists is 'Reverence—honour done to those who are grander and better than you, without fear; distinct from fear.' This is all well put by Carlyle in his address to the students at Edinburgh, when he was installed as Lord Rector. Referring to the passages in which Wilhelm's instructors come to the question of religion in education, Carlyle says: 'Goethe practically distinguishes the kinds of religion that are in the world, and he makes out three reve-

rences. . . . The first and simplest is that of reverence for what is above us. It is the soul of all the pagan religions; there is nothing better in man than that. Then there is reverence for what is around us or about us—reverence for our equals, to which he attributes an immense power in the culture of man. The third is reverence for what is beneath us—to learn to recognise in pain, sorrow, and contradiction, even in those things, odious as they are to flesh and blood—to learn that there lies in these a priceless blessing.' (*See* Lewes's *Life of Goethe* (Longmans); also Carlyle's *Wilhelm Meister*, &c.)

Governesses' Benevolent Institution, incorporated 1848. Office, 32 Sackville Street; Home and Registration Office, 47 Harley Street; Asylum, Chislehurst. Affords temporary assistance to governesses in distress, a provident fund, annuities to aged governesses, a home for governesses between their engagements, and an asylum for governesses above the age of fifty. Invested funds, 161,612*l*.

Government Schools.—This is a name popularly given to schools known officially as 'public elementary schools.' An 'elementary school' is defined by section 3 of the Act of 1870, as 'a school at which elementary education is the principal part of the education there given, and does not include any school or department of a school at which the ordinary payments in respect of the instruction exceed ninepence a week.' By section 7 of the same Act a '*public* elementary school' is defined as an elementary school conducted in accordance with the regulations there laid down. These are: (1) The admission of children must not depend upon their attending or abstaining from attending any Sunday school or place of worship, or any religious observances or instruction in the school or elsewhere. (2) Religious observances or instruction must come at the beginning or at the end of a school session, and any child may be withdrawn therefrom. (3) The school must be open at all times to Her Majesty's Inspectors, who may not inquire into the religious instruction given or examine in religious knowledge. (4) The conditions laid down in the code (*q.v.*) must be observed. Public elementary schools are either BOARD or VOLUNTARY (*q.v.*).

Grading. *See* CLASSIFICATION.

Graduate (*gradus*, a step).—This term is used to signify both the act of taking a university degree and the person who takes it, either by examination or *honoris causa*. In America the term is also applied to the act of conferring degrees by universities. The regulations for graduation differ widely in different universities, but it is usual for candidates to graduate first as bachelors, and subsequently as masters or doctors. In the Scottish universities, however, the bachelor's degree in the faculty of arts (though not in the other faculties) was abolished in 1861, and candidates can proceed to the full M.A. degree by passing an examination in classics, mathematics, and philosophy, or can take the degree in three parts by passing an examination in each of these departments separately. Matriculated students of universities previous to taking their degree are called undergraduates. (*See* DEGREES.)

Grammar.—Grammar is the science of correct speech, i.e. of certain select usages of speech. A grammar of any language is a systematic classification of the correct usages of that language. Thus, grammar stands to speech as logic to thought. It is true that the term 'grammar' is often used in a wider sense, to cover an examination into the relations of different families of languages (comparative grammar), or even an inquiry into the origin of language. But these questions belong to the more general science of language. Etymology and word-formation are no part of grammar proper; they are correctly described as philology, in the narrower sense of that term. Prosody and metre are admitted into grammars only by courtesy. In a word grammar is only part of the greater science of speech. The laws of correct speech may be summed up under two headings: (1) Accidence, or the doctrine of correct forms (*Formenlehre*); (2) Syntax, or the doctrine of correct sentences. These two departments are no doubt in reality merely two classifications of the same set of phenomena from different points of view. A correct sentence cannot be constructed without correct forms; correctness of form has no meaning except in relation to the function which forms exercise in sentences. But for convenience words may be considered both in isolation (accidence) and as connected in the sentence (syntax).

The value of grammar has often been called into question during the present

century. The great Jacob Grimm, in the preface to his *German Grammar*, declared the grammatical method to be pedantic in character and injurious in result. He maintained that grammar impeded the free development of the faculty of speech, which, if left to itself, would grow with the growth of the mind, and reach a far higher degree of perfection than when tutored and tortured by the rigid systems of the grammarians. This criticism was directed in the first instance against the abuses of grammar as taught by the empirical methods of the time. The only grammar that Grimm recognised was historical grammar—an inquiry into the course of development through which language has passed and is still passing. But the censures of Grimm undoubtedly express a large measure of truth as against any grammatical system. Grammar, being the expression of the usages of the literary language, no doubt does act as a retarding force—'freezing the current of natural speech,' to use Professor Max Müller's metaphor. 'Dialectical regeneration' has a less free field when brought under the influence of grammar; even the linguistic development of the individual may sometimes suffer from its constraint. But the advantages are not altogether on the side of natural speech. If it is desirable to maintain at any given time a standard of correctness to which individual taste must bow, if it is an advantage to a nation to possess a common medium of communication for the educated, with certain well-defined usages corresponding to certain distinctions of thought, then the *raison d'être* of grammar is established. It is the function of grammar to resist the introduction of such changes as depend, not upon a general consensus of feeling, but upon individual caprice or a mistaken idea of correctness. At the same time the grammarian must beware of attempting to exercise summary jurisdiction over speech. His function is to register the usage of the present, not to legislate for the future. When the current definitely sets in a particular direction, it may be strong enough to overthrow grammatical barriers; and in such cases the grammarian must adapt his rules to reformed usage. In many cases, however, grammar may exercise a salutary influence in conserving a sense for the refinements of speech, which are apt to be obliterated by popular usage. The day may come when English will have no subjunctive mood, and we shall say, 'If I *was* you' instead of 'If I *were* you.' There is a tendency in some parts of Germany to use the 'conditionals' in the if-clauses of conditional sentences ('Wenn er es thun würde,' &c.). But grammar is as yet justified in prohibiting such constructions. There have indeed been found scholars, such as Mr. H. Sweet, ready to defend 'It is *me*,' and similar constructions. But they will hardly find support at present among the cultivated.

The practical question for the teacher as to the use of grammar may be considered under two heads:

1. The use of grammar in schools where the mother tongue alone is taught.

2. The use of grammar in schools where foreign languages are taught.

1. It is perfectly true that children belonging to cultivated homes may learn to use language correctly and effectively without any formal study of grammar. But on the one hand many children do not hear correct speaking at home, and on the other hand correctness of habit is liable to degenerate when the pupil is brought into contact with the less refined usage of the world at large. Besides, this very influence of the cultivated home is an artificial influence, checking the natural tendencies of the young mind. Children, if left to themselves, proceed to develop their speech by analogy and in total indifference to accepted usage. They say 'bringed' for 'brought,' 'mouses' for 'mice,' 'it is me' for 'it is I' (because what usually follows the verb is the object). The half-educated man who has been taught to say 'It is I,' proceeds to infer that he ought also to say 'between you and I.' But we may go much further. Even writers of eminence commit solecisms which they would be far from attempting to justify if their attention were called to them. Mistakes of substituting indicative for subjunctive and subjunctive for indicative in conditional sentences are to be met with even in leading writers. 'I should have liked to *have* seen him' is often heard and read. Numerous other examples might be quoted from Professor Shadworth Hodgson's *Errors in the Use of English*. To correct such errors is one of the main functions of grammar. It is maintained by Mr. Fitch (*Lectures on Teaching*, 1881, p. 258) that 'the direct operation and use of grammar rules in im-

proving our speech and making it correct, can hardly be said to exist at all.' But this view appears to rest upon a mistaken doctrine as to what constitutes grammar. Mr. Fitch considers 'that of pure grammar there is very little in the English language,' grammar being in his view 'the logic of language in so far, *and in so far only*, as it finds expression in the inflexions and forms of words' (*ibid.* p. 261). Why? Surely there is no sufficient ground for excluding from the scope of grammar any means which a language may employ to express differences of thought. Inflexion is only one of those means; a more important means in English is the use of certain substitutes for inflexion. Are we to exclude the modes of expressing time relations from an English grammar because English has, properly speaking, only two tenses, i.e. inflected forms expressing time relations? Are we to exclude the equivalents which supplement the subjunctive mood where distinct forms are no longer extant? If so, no doubt English syntax will have a very small scope, and its rules will be mostly valueless in correcting errors of speech. 'No warning is needed against such mistakes as "Give *I* the book;" "Lend the money to *he*"' (*ibid.* p. 259). It was some such view as this which led Dr. Johnson in his *English Grammar* to treat the whole syntax in ten lines, 'because our language has so little inflection that its construction neither requires nor admits of many rules.' The answer is, that to treat English in this way is to ignore the essential difference which separates it from languages of the classical type, and to some extent from other Teutonic languages. To deny that English has a grammar is to deny it law and order, and to reduce it below the level of Chinese. The grammar of English is a very subtle grammar, and its usages, if difficult to register, demand all the more investigation and study.

There is another use of grammar besides its practical use. As a science, grammar 'reveals the laws and principles which underlie, and account for, the speech which I am using every day' (Mr. Fitch, *ibid.* p. 260). Here its character is theoretic, and it serves not only to disclose the laws which govern an important object of study, but also to strengthen the reasoning faculties. How far such conscious study of the mother tongue is desirable in elementary schools is a question. Some eminent authorities hold that one may encourage the young mind too early to processes of abstraction and reflexion, and that systematic grammar should not be introduced until the pupils have command over a large vocabulary, and have made considerable acquaintance with the concrete phenomena of language. This not only from a psychological point of view, but also in the interests of grammar itself: for grammar cannot be profitably pursued *in vacuo*, especially the grammar of the mother tongue. But at some stage of the pupil's development it is well to make conscious the principles of the speech which he is using. The ear and memory, however well trained by habit, will not always serve as guides, and the mental discipline derived by conscious reflexion on the usages of speech is itself a power which emancipates from the thraldom of words. 'Words, as a Tartar's bow, shoot back upon the understanding of the wisest, and mightily entangle and pervert the judgment' (Bacon).

In regard to method, sound educational theory demands that the teaching of English be based on *analysis* rather than *synthesis*. 'Long before a child comes to the commencement of grammar he has learned to speak. . . . That which in teaching French is the ultimate goal of your ambition, conversation and freedom in using words, is the very point of departure in the case of your own vernacular speech . . .' (Mr. Fitch, *ibid.* p. 261). This maxim is true of the mother tongue of every nation; it is especially true of the teaching of English to English children, for the logical character of the language—its absence of inflection, its dependence on position for indicating function—forces upon the teacher a logical treatment. By breaking up the sentence—by effecting that separation of its parts by which it ceases to be an organic whole—the pupil is led to a classification of the parts of speech by way of their function in forming sentences. The dead members of the living whole may be then studied in isolation (accidence), and in their relation to other parts of the sentence (syntax). The importance of the latter study to pupils who are sufficiently developed to enter upon it, can hardly be over-estimated. Syntax involves a classification of sentences and sub-sentences (clauses), a nice discrimination of the effects produced by mood and

mood equivalents in different kinds of sentences, an accurate use of tenses. All these things together will not make a great writer, but they will make a careful writer, and to some extent an accurate thinker, and they will encourage an attitude of respect for the great inheritance which is the birthright of English-speaking children.

2. The utility of grammar in learning other languages is still less contestable. No methods of teaching, except the purely empirical method of the *bonne*, really attempt to dispense with it. For in learning foreign languages synthesis, i.e. the process of building up from simple elements, must play a large part. The pupil's mind is at first a blank; the first step must be of a very simple and easy nature. It is true that very different opinions are held as to the extent to which it is advisable to imitate the 'natural' method by which a child learns its own language. And it may fairly be contended that a child whose ear is accustomed to French or German from early years will learn much by simple imitation. But it is found by experience that this process by itself is insufficient; the impressions left are not strong enough to form a substitute for more methodical knowledge, though they may supplement that knowledge in a very valuable manner. It is impossible to reproduce the conditions under which a child learns its own language; and some degree of synthesis soon makes itself felt by the practical teacher. Such synthesis must be based on a classification of language—on grammar. Of course it does not at all follow that rules must be learnt by heart; it may be often desirable to proceed *per exempla*, as Comenius said, rather than *per præcepta*; but the examples will be classified and arranged on grammatical principles. The 'natural' method proceeds by way of unclassified examples. But on the other hand the teacher should be fully alive to the limitation under which grammar labours. As 'subtilitas naturæ subtilitatem artis multis partibus superat' (Bacon), so grammar is ultimately unable to render account of all the phenomena of speech. There is a point beyond which grammar loses itself in a bewildering maze; and though this point may be never reached by the pupil, the teacher, if he thinks to the purpose about grammar, will find it out, and should not be daunted by the fact. He must remember that without grammar no scientific classification of speech—no methodical teaching—would be possible. (*See* PARALLEL GRAMMARS.)

Grammar Schools.—Grammar schools, as their title implies, were founded for the teaching of grammar—for the purpose of providing, not primary or elementary education for the nation at large, but secondary or higher education for scholars. They were intended, in fact, to prepare boys of more than average ability for the Universities, or at least to give them such a learned education as would qualify them afterwards for useful service to the Church and the State. From the foundation of Winchester in 1373—or even from the date of Wantage, which claims King Alfred as its founder—down to the present century, the staple school subject, sometimes the only one, was Latin; and the way to learn Latin was to learn its grammar. Of grammar schools whose date is known, there are only eight before the foundation of Eton in 1441. The number of foundations, however, begins to be great even as early as the closing years of Henry VII.'s reign; and the tide advances steadily till the reign of James II., when it comes almost to a stand. In Henry VIII.'s reign (thirty-eight years) the number of schools founded is forty-nine; in the six years of Edward VI. the number is forty-four; in Elizabeth's reign (forty-five years) we have one hundred and fifteen; and in James I.'s reign (twenty-two years) the number is forty-eight. The statutes of the grammar schools founded by the Crown or by private benefactors were all, or nearly all, on one model, combining Latin with religious instruction. Greek came in with the foundation of St. Paul's School by Colet in 1509. But in the statutes drafted by Wolsey for his school at Ipswich soon after there is no mention of Greek; nor does Bishop Oldham name the subject for Manchester Grammar School in 1525, though he wishes the young who 'have pregnant wits' to be given the opportunity of learning grammar, 'the ground and fountain of all the other arts and sciences.' In the statutes of Harrow (founded 1571) amongst the authors mentioned there is only one Greek poet—Hesiod; but the boys are 'to be initiated in the elements of Latin versification very early.' The statutes of the later schools generally prescribe Greek and 'verses.' Archbishop Grindal, for

example, requires for St. Bees (1583) 'a meet and learned person that can make Greek and Latin verses, and interpret the Greek grammar and other Greek authors.' The same applies to Hawkeshead school in Lancashire (1588), where 'the chiefest scholars shall make orations, epistles, and verses in Latin and Greek for their exercises,' and all the scholars 'shall continually use the Latin tongue or the Greek tongue as they shall be able.' So again, Archbishop Harsnet wishes for Chigwell (1629) 'a man skilful in the Greek and Latin tongues, a good poet.' In a few cases, Hebrew is required of the head-master, as at Bristol, Southwark (1614), and Lewisham (1652). But in by far the larger number of schools, Greek and Latin alone are specified; and in some it is especially said that 'Greek and Latin only,' or 'the classics only' are to be taught. Charterhouse (1611) is an exception. In its statutes (dated 1627) we find that scholars shall be taught 'to cypher and cast an account, especially those that are less capable of learning, and fittest to be sent to trades.' In 1864 a royal commission was appointed to inquire into the revenues management and education of certain endowed schools, and to suggest measures of improvement. There had been previously two commissions of inquiry: the first in 1858 to report on the education of boys and girls of the labouring class: and the second in 1861 to report on the nine greater public schools — Charterhouse, Eton, Harrow, Merchant Taylors', St. Paul's, Westminster, Rugby, Shrewsbury, and Winchester. The scope of the commission of 1864 embraced all schools which lay between those dealt with by the other commissions, that is, the great mass of 'grammar schools, and issued its report in 1868. Upon this report was founded the Endowed Schools Act of 1869, which gave authority first to 'Endowed Schools Commissioners,' and afterwards to the 'Charity Commissioners,' to frame new schemes for the better working of these 'grammar schools'; and also for furthering the advancement of education by diverting for the schools other endowments not originally intended for educational purposes. Nearly all the schools have since been remodelled. A Select Committee of the House of Commons was appointed in 1886 to inquire into the working of the Act, and in the following year issued their report, in which they state that the sum of the evidence brought before them was conclusive on two points: first, the principles laid down by the commission of 1864, and embodied in the Endowed Schools Act, while in some respects they must be modified by altered circumstances and increased experience, are on the whole sound and just; and secondly, that the Charity Commissioners have in their procedure faithfully attempted to carry those principles out. The complaints made against the working of the Act, the Committee add, are founded on a failure to appreciate the value of these principles and their bearing on national welfare. The subject is, however, they admit, difficult and complicated; 'and till it is more widely and carefully studied, till greater publicity has been given to the results of the schemes by inspection and parliamentary returns, till such adaptation of schools to technical and commercial purposes has taken place as the Committee suggest, and till the schools have been allowed time to develop their beneficial results, complaints will continue to be made.' The denominational difficulties which occupied so large a place in the inquiry of the Select Committee of 1873 appear in nearly all cases to have been accommodated by the lapse of time and a better understanding of the real questions involved. Disputes of class, in some localities, have now replaced them, but may in their turn die away under a judicious administration governed by an intelligent popular opinion. The tendency to attach excessive importance to theoretical excellence of educational machinery under a fixed system of graded schools, rather than to adapt the schools to the practical needs of the locality, is now, the Committee state, corrected by experience. 'A more pressing need now seems to be that we should not forget, in the search for more immediate advantages of an obvious nature, the importance of preserving, even at some cost, a high ideal of secondary education, both on its own account, and in its connections either with the Universities, or with the excellent colleges which have been recently established in our large towns with the special object of education in relation to the needs of manufacturing and commercial communities.' The Committee find that the work done by the Charity Commissioners under the Endowed Schools Acts, while it has not lost sight of

this ideal, has done much to bring higher instruction, in popular and necessary forms, within the reach of classes which otherwise would have been shut out from it.

Grammatical Society. *See* PARALLEL GRAMMARS.

Grammaticus. *See* ROMAN EDUCATION.

Grants (Government).—It was in 1832 that Parliament made the first grant in aid of elementary education. The sum voted was 20,000*l.*, and a similar sum was voted annually down to 1838. The grant was administered by the Treasury, subject to conditions laid down in a minute dated August 30, 1833. These were, briefly, that the money was only to be used in aiding local effort towards the building of schools; though the grant was in no case to exceed half the cost of the buildings; the applications were to be endorsed by the National Society (*q.v.*), or the British and Foreign School Society (*q.v.*); and that preference was to be given to applications 'from large cities and towns in which the necessity of assisting in the erection of schools' was 'most pressing.' In 1839 the grant was raised to 30,000*l.*, and its administration was entrusted to a specially created committee of the Privy Council —the Committee of Council on Education, or the Education Department (*q.v.*). The first minute issued by the new body (that of June 3, 1839) recommended 'that the sum of 10,000*l.*, granted by Parliament in 1835 towards the erection of normal or model schools, be given in equal portions to the National Society and the British and Foreign School Society (*q.v.*) for that purpose. The right of Government inspection was to be a condition of all future aid, and the minute provided for the appointment of inspectors. The bulk of the grant was to be applied, as before, in the erection of schools. The minute of November 22, 1843, added the building of teachers' houses, and the purchase of appendages, to the objects for which money might be given. On August 25, 1846, a very important minute was issued, greatly extending the scheme of State aid. Its terms were general, but it was followed, on December 21, by another minute converting them into definite regulations. These dealt, first of all, with pupil-teachers. In schools properly furnished, organised, and disciplined, and possessing a head-teacher competent to instruct and train pupil-teachers, one such pupil-teacher for every twenty-five scholars might be apprenticed to the head-teacher. The apprenticeship was to be for five years, at the end of each of which there was to be a Government examination. If the result was satisfactory, the pupil-teacher received from the Education Department a stipend beginning at 10*l.*, and rising by annual increments of 2*l.* 10*s.* to 20*l.*, while the head-teacher received 'the sum of 5*l.* for one, of 9*l.* for two, of 12*l.* for three pupil-teachers, and 3*l.* per annum more for every additional apprentice.' Pupil-teachers who had served their time might submit themselves to an examination conducted by one or more of Her Majesty's Inspectors, together with the principal of a normal school or a training college 'under inspection.' Those who satisfied the examiners became 'Queen's Scholars,' and received an exhibition of 20*l.* or 25*l.* tenable at one of the colleges. The training there might be for one, two, or three years. At the end of each year there was an examination, and for every successful student of the first year the college received 20*l.*, of the second year 25*l.*, and of the third year 30*l.* When these trained students left, and entered upon school-work, they received, in augmentation of salary, Government grants varying from 15*l.* to 30*l.* according to the length of their training. For teachers rendered incapable by age or infirmity the minute promised pensions. In 1847 a 'broad sheet' was issued containing the conditions on which Certificates (*q.v.*) were to be obtained by untrained as well as by trained teachers, and offering from 10*l.* to 20*l.* a year 'certificate money' according to class and division. These regulations exercised a very powerful influence upon education. By 1851 twenty-five training colleges had been established, six thousand pupil-teachers were at work, more than eleven hundred certificates had been issued, the grant had risen to 160,000*l.* a year, and nearly 3,800 schools had been built at a cost to the State of 400,000*l* and to the localities of about 600,000*l.* more. The next important step was taken in 1853. A minute (dated April 2 of that year) established capitation grants for the support of schools 'in rural districts and small unincorporated towns' ('small' being defined as containing not more than five thousand inhabitants), the amount of grant per

head varying with the number of scholars. If there were under fifty it was 6*s.* in boys' schools, and 5*s.* in girls' schools; if above fifty and under one hundred, 5*s.* and 4*s.* respectively; if above one hundred 4*s.* and 3*s.* The payment of the capitation depended upon the amount raised locally for the school, the fee charged, the salary of the head-teacher (who must be certificated), and the results of the examination. By a minute of January 26, 1856, urban as well as rural schools became eligible for capitation grants. In 1860, when Mr. Robert Lowe (Lord Sherbrooke) was the guiding spirit of the Education Department, the many minutes which had been issued were combined into a code, generally known as the Original Code. In 1861, after the Duke of Newcastle's Commission had reported, the Revised Code was issued. It remodelled the whole system of aid. All grants to head-teachers and to pupil-teachers were abolished; pupil-teachers were to be apprenticed, not to the head-teacher, but to the managers of the school, and the promise of pensions was withdrawn. The Revised Code introduced the principle of 'payment by results' (*q.v.*). There was to be an absolute grant of 4*s.* a head on the average attendance, and each child who had attended at least two hundred times (half-days) during the year might earn an additional grant for the school. In the case of children under six it was 6*s.* 6*d.*, subject to the inspector's approval; in the case of children above six it was 8*s.*, subject to the results of an individual examination. For each one who passed a specified 'standard' in reading, 2*s.* 8*d.* was to be paid, for each 'pass' in writing 2*s.* 8*d.*, and for each 'pass' in arithmetic 2*s.* 8*d.* Building grants were continued. In the normal schools the training was to be for two years, and the college was to receive 100*l.* for each master trained, and 70*l.* for each mistress. On the passing of the Elementary Education Act of 1870 a new Code (*q.v.*) became necessary. The Act provided that after December 31, 1870, no application for a building grant could be entertained. The absolute grant was raised from 4*s.* to 6*s.*, the number of attendances qualifying for examination from two hundred to two hundred and fifty, the conditional grant for infant schools from 6*s.* 6*d.* to 8*s.* or 10*s.*, and for older scholars from 2*s.* 8*d.* to 4*s.* per 'pass.' In 1875 this 4*s.* was reduced to 3*s.*, but grants for 'class subjects' and for 'specific subjects' were introduced. 'Class subjects' were geography, grammar, and history; and a grant of 4*s.* on the average attendance was to be paid if the classes (not the individual pupils) passed satisfactorily in two of them. The 'specific subjects' were more advanced, and a grant of 4*s.* per subject was to be paid for every child in the upper standards who passed in not more than two of them. When Mr. Mundella became Vice-President of the Committee of Council, the regulations were once more recast. The transformed code was issued on March 6, 1882. It introduced a 'merit grant,' varying as the inspector pronounced a school to be 'fair,' 'good,' or 'excellent.' It abolished a minimum number of attendances as a qualification for examination, and required all children to be presented who had been on the rolls during the last twenty-two weeks of the school year. In infant schools there was to be on the average attendance a fixed grant of 7*s.* or 9*s.*; a merit grant of 2*s.*, 4*s.*, or 6*s.*; a needlework grant of 1*s.*; and a grant of 1*s.* for singing from notes. In schools or classes for older scholars the grants for needlework and singing were to be the same; the fixed grant was to be 4*s.* 6*d.*, and the merit grant 1*s.*, 2*s.*, or 3*s.* There was also to be 'a grant on examination in the elementary subjects (reading, writing, and arithmetic) at the rate of one penny for every unit of percentage.' Thus, if one hundred children were examined the number of possible passes would be three hundred; if the number actually obtained was two hundred and seventy the percentage would be ninety, and the grant ninety pence on the average attendance. For 'class subjects' (extended to five, of which only two could be taken) the grant was 1*s.* or 2*s.*, according as the results were 'fair' or 'good.' The regulations respecting specific subjects underwent no material change. The Mundella Code remains, with very slight modifications, still (1889) in force. (*See* Craik's *State and Education.*)

Greek.—No one who has ever mastered Greek can have any doubt of the advantage of learning it. It is the vehicle in which Greek civilisation, a unique product of the human mind, expressed itself. It is the language employed by many of the men who occupy the highest places among

the thinkers, the poets, the philosophers of the world. The Greek mind gave rise to nearly all the forms of literature which are now prevalent. Many of its productions are among the freshest, the most original, and the most beautiful that exist. And the Greek writers have been singularly stimulative. It was the works of the Greeks that created the Renaissance. It was criticism of the Greeks that led to the outburst of German literature in the end of the eighteenth and beginning of the nineteenth centuries. And what it does for nations it does for individuals. Schiller was determined in his career by the enthusiasm with which Euripides inspired him. The value of Greek literature to the modern mind is inestimable, and no one who has ever enjoyed the Greek works in the language in which they were written could ever imagine that translations can convey an adequate idea of their beauties. Besides this supreme excellence from a literary point, a special interest belongs in the eyes of some to the Greek language, because we can trace in its words the first dawnings of science; and in the eyes of others because the authoritative documents of Christianity were written in it.

Its place as an instrument of education has been a subject of keen discussion. It is necessary that in the training of a boy from eleven to eighteen years of age some one language and literature should form the central educative force, and the great majority of educationists have held that this language must be Latin (*q.v.*). But some of the greatest philosophers and educationists have assigned that place to Greek, and among them stands out pre-eminently Herbart. This philosopher maintained that the literature ought to determine the question of priority. Greek literature opens with Homer. Homer deals almost exclusively with the concrete. There are no ideas in him beyond the reach of a boy of ten or eleven. And he is fascinating reading for a boy. There is no Latin book that can at all approach the *Odyssey* in its power to interest a young boy. The *Iliad* and the *Odyssey* are products of the early youth of the world, and they picture the ideas and pursuits of early youth, but it is an early youth noble and generous. What could be more useful for a boy than to permeate himself with these heroic ideals? What more likely to lay the foundation of a noble and lofty character? Then from Homer the boy can advance to the charming narrative of Herodotus, and at a further stage he could read Plato and Xenophon with enjoyment, for most of their ideas are within his grasp, and Plato especially surrounds them with every literary grace. The boy, then, having saturated himself with the best and most beautiful parts of Greek civilisation, could pass on to Roman, and from Roman to modern times. On such a system language forms a subordinate element of training. It is not necessary to drill the boy in all the minute details of grammar. He should learn only so much as is required for the comprehension of the author. And then, even in respect to language it is urged that the plan has its advantages. A knowledge of the Homeric dialect is essential to a true conception of the origin of the Attic. The boy can see how the forms of the one have grown to some extent out of the forms of the other.

The idea that Greek ought to be taught before Latin was not first suggested by Herbart. A list of those who preceded him in this plan is given in Herbart's *Pädagogische Schriften*, vol. i. p. 77, and among them is mentioned the famous printer and scholar, Henricus Stephanus (Henri Étienne, 1528–1598). In recent times Ahrens prepared a Homeric grammar, adapted for beginners; Dissen and Passow strongly approved of the plan, and some of Herbart's followers carried it into practice. Within the last few years Herbartism has revived in great force in Germany amongst those who take an interest in secondary education, and the question of the priority of Greek will again come to the front.

The same questions have been discussed as to the mode of teaching Greek which we have noticed in connection with Latin (*q.v.*), but not with the same intensity. After one language has been employed in training a boy, there is no need of the same elaborate process in teaching a second. The boy is advanced in age, and can learn a language much more rapidly; and he is advanced in logical power and strength of memory, and can dispense with many of the processes necessary during the learning of a first strange language. Therefore Greek is learned in its elements much more easily than Latin, after Latin has been mastered. It is for this reason that

it is very injudicious to begin Greek at too early an age if it is to succeed Latin, and the whole tendency of the present day is to defer the learning of Greek until very considerable progress has been made in Latin. Then, again, there is no longer the same necessity for such frequent exercises in turning English into Greek.

In recent times the application of comparative philology to Greek grammars has become prevalent. The laws of the combination of the root with the inflection have been carefully laid down at the commencement and carried out through all the paradigms. Mention should also be made of the suggestion that access should be made to ancient Greek through modern, which has retained or adopted many of the forms of the ancient. But generally the Attic dialect is regarded as the form of the language which must be mastered first. Some have a superstitious reverence for this form, and refuse to proceed further. But most proceed from the Attic and explain the other dialects by means of it or in comparison with it.

The works which treat of the value of Latin in education and the methods of teaching it generally discuss also the value of Greek and the methods of teaching it. To the works mentioned in the article on Latin we must add the *Erläuterungen* of Curtius to his *Greek Grammar*, which treat exclusively of Greek.

Gresham College, Basinghall Street, London, was founded in 1501, by Sir Thomas Gresham, with a view to providing free scientific instruction to the people. He gave directions for the delivery of lectures by qualified professors. Lectures are still delivered by professors appointed by the Gresham Committee at three different periods in the year, commencing respectively the first Monday in October, on the fifteenth Monday after that date, and on the twenty-sixth Monday after the first Monday in October, or on the nearest Monday to such twenty-sixth Monday which will allow of the condition that no lectures be given in Passion Week and Easter Week. The value of the original bequest of Sir Thomas Gresham has, it is believed, enormously increased, and great complaints are made that the accumulation has not been devoted to the purpose which the munificent founder of the lectureships intended. In his will Gresham prayed that the curse of God might rest on those who misappropriated his bequest.

Gresham Lecture. *See* PRELECTIONS.

Groote, Gerard. *See* RENAISSANCE.

Growth of Children.—A fair knowledge of the physiological laws of health would prevent dangerous mistakes in the education of children. It should be remembered that every organ of the body is rapidly growing, and that height and weight are being steadily increased. Children not only have to replenish waste tissues, but also to build up new tissues. Hence, it is necessary that they should be supplied with an abundance of food and fresh air, and that their rapidly growing organs should not be over-exerted. This is especially true of the brain, which in the early years of life grows more rapidly than any other organ. A periodical record of the height and weight of children would be of great value in the preservation of health and detection of early disease. If a child ceases to grow or increase in weight, or if on the other hand he grows too rapidly, he requires a comparative cessation of school-work and careful home attention. One of the earliest symptoms of incipient consumption is a diminution in weight, and such loss of weight should at once receive medical attention. The following statements of the average height and weight of boys of the non-labouring classes are taken from Dr. Newsholme's *School Hygiene*, which may be consulted for other tables and charts on the same subject.

Age last birthday	Average height in inches	Average weight in pounds
7	46·10	50·16
8	47·66	56·40
9	50·30	61·06
10	52·65	67·22
11	53·93	73·31
12	55·90	78 96
13	58·30	85·27
14	60·27	96·40
15	63·00	107·25
16	65·34	115·96
17	66·91	131·93
18	67·38	136·68
19	67·74	142·00
20	68·09	145·23

During the first twelve years of life boys are from one to two inches taller than girls of the same age. At about 12½ years of age, girls begin to grow

faster than boys, and during their fourteenth year are about one inch taller than boys of the same age At about 14½ years of age, boys again become the taller, girls at this age having nearly completed their growth, while boys continue to grow rapidly till nineteen years of age.

Guizot, F. P. W. (*b.* at Nîmes, 1787; *d.* at Val Richer, 1874).—This eminent French statesman and writer had an important position in the history of education in France, on account of the reforms he instituted as Minister of Public Instruction. He passed measures which have been a lasting honour to his name. The right of education was freely and fully discussed, and Guizot undertook to establish, at least primary education. He recommended its being compulsory, and touched upon the question of free education, but thought that though the State should offer education to all, it could only give it to the children of those families who were unable to pay. Through Guizot's influence a decree was passed for training masters for elementary schools; and with a view to their pensions, savings banks were established, and insurance societies founded.

Grey, Maria. *See* EDUCATION OF GIRLS and TRAINING OF TEACHERS.

'Gutter to University.' *See* INSTRUCTION (COURSE OF).

Gymnasium (Greek, *γυμνάσιον*, from *γυμνός*, naked) was originally among the Greeks a space measured out and covered with sand, for the exercise of athletic games. Afterwards, among the classical Greeks, the gymnasia became spacious buildings or schools for the mental as well as the corporeal instruction of youth. The first gymnasia were built by the Lacedæmonians, as Plato tells us (Νόμοι, lib. i.), and after them by the Athenians. Those in the immediate neighbourhood of Athens are well known: the Academia, where, attracted by the pleasant walks which surrounded it, and the concourse of people of all classes who daily resorted thither, Plato held conferences with his pupils; the Lyceum, to which Aristotle resorted; and the Cynosarges. The gymnasia of the Romans were on a grander scale, and from the extensive baths attached to them were not uncommonly called 'thermae.' The numerous exercises of the gymnasium were conducted under the special direction of the State, and were superintended by several officers at Athens. The chief officer was called gymnasiarchus, who superintended the whole gymnasium and its exercises; the xystarchus superintended in particular the more athletic exercises; the gymnastes, being skilled in medicine, prescribed the kind and extent of exercise of each; the pædotribes assisted and instructed those exercising; while there were numerous servants set apart to each kind of exercise, to anoint, to keep the bath, &c.

In Germany, the *Gymnasien* are what we should call classical schools, the commercial schools being called REALSCHULEN (*q.v.*). The *Gymnasien* are like our best classical schools. There is the same preponderance of classics, very nearly the same methods of teaching, and to a considerable extent the same results. It is supposed that a boy enters at nine, and remains till nineteen. The school is divided into six classes. Latin begins at the bottom, and occupies ten hours of the week out of twenty-eight till the head class, and then eight hours out of thirty. Greek begins two classes from the bottom, and occupies six hours a week throughout; German, two hours; arithmetic and mathematics, from three to four; French, three in the lower classes, two in the higher; geography and history, three in the higher and two in the lower; natural science, two in the head class and one below. All learn drawing in school hours; singing and gymnastics out of school. This programme is fixed by the Government, but within the programme the masters are free. In general the gymnasium is steadily to regard the formation of the pupil's mind, and of his powers of knowledge, without prematurely taking thought for the practical applicability of what he studies. It is expressly forbidden to give this practical or professional turn to the studies of a pupil in the highest forms of a gymnasium, even when he is destined for the army. In some places, where it is not possible to maintain a complete gymnasium, a progymnasium is substituted. A progymnasium is merely a gymnasium without the higher classes. Most progymnasia have four classes only, some three; some again, five, that is, all but the head. All the gymnasia are supported by endowments and school fees. Very little indeed is spent upon them by the State, though, as in England, a few belong to the municipalities. The school fees are exceedingly

low; not only lower than in England, but lower than in France, the average being under 3*l.* a year for instruction, even in the best schools. The masters do not receive the fees, but are paid fixed salaries out of the funds thus raised. The maximum salary scarcely ever exceeds 300*l.* a year and a house. There are 144 *Gymnasien*, containing about 47,000 boys, and 28 *Progymnasien*, containing about 2,600 boys. In England, the term gymnasium is applied strictly to a school for the improvement of bodily strength, grace, or agility, or for gymnastic exercises.

Gymnastics. *See* ATHLETICS, CALISTHENICS, and PHYSICAL EDUCATION.

Gyp (Greek γύψ, a vulture).—A term applied at Cambridge to the male attendants on University men in their rooms. It is equivalent to *scout*, the name by which the college attendants are designated at Oxford.

H

Habit is the name of the principle or law according to which every action becomes easier by repetition. The result of such repetition or practice when the process is complete is called a habit. Habits are thus acquired possessions, and so distinguished from original or instinctive endowments. The principle of habit operates throughout the whole of development, bodily as well as mental. Thus all muscular actions become perfected by repetition and habit, requiring less and less co-operation of the conscious mind. We thus see that habit, like memory, to which indeed it is so closely allied, has its basis in certain properties of the physical organism. In the region of mental activity we observe the effect of habit in the way in which thoughts become firmly associated one with another in definite groups or series, as the consequence of repetition or custom, and also in the way in which the thinking processes gain in facility and exactness through practice. The emotional sensibilities again are under the influence of the same law, though in a less obvious manner. The operation of the principle here is seen in the building up of firm attachments and permanent affections towards the objects and persons in the child's environment, with their correlative sense of want and craving when these are absent. Finally, habit rules in the domain of voluntary action. All the higher exercises of will in checking impulse and controlling the thoughts and feelings become perfected by customary performance, and in this way the so-called Moral Habits, as temperance, truth, &c., are built up. Habits have been divided into Intellectual and Moral, and also into Active and Passive, habits. From this short account of the nature and scope of Habit we may easily see that it is the great guiding principle of education. According to Locke it is 'the secret of instruction in all arts, and, indeed, in conduct too, to get what we would teach settled in the pupil by *practice* till it becomes a *habit*. [*See* Mr. Quick's edition of the *Thoughts concerning Education*, Introduction, p. liv.] The whole training of the body and of the mind proceeds on the principle of habit; and the great object of moral education is to induce by steady practice in well-doing a fixed disposition towards duty. Since the formation of habit is only possible where the brain and the connected mental faculties have a certain plasticity or pliability, it is of the greatest consequence in education to lay the foundations of good habits in the early years of life. While the law of habit is thus of the greatest service to the educator, he must bear in mind that it tends to produce a mechanical and unconscious mode of action, and he must seek to counteract this tendency, where it is injurious, by exercising the child in the processes of reflection and deliberation.' (*See* Bain's *Mental and Moral Science*, bk. iv. chap. ix.; Sully's *Teacher's Handbook*, p. 446 and following, 467 and following; and P. Radestock's *Gewöhnung und ihre Wichtigkeit für die Erziehung*.)

Half-Timers. *See* SCHOOL BOARDS.

Hamilton, James (*b.* London, 1775; *d.* Dublin, 1829), the author of the *Hamiltonian Method of acquiring Languages*, commenced his career as a merchant, and visited Hamburg, where he studied French under the direction of a military exile, General d'Angely, by whom he perfected the method to which he has given his name. This method consists in translating

word for word short pieces, and obtaining mastery of a vocabulary before learning grammar. By this means he was able to read French authors with an occasional reference to the dictionary. On the same plan he learnt German and Italian. He did this at first merely for self-culture, but owing to losses in trade he determined to go to America, where he commenced to teach languages. The novelty of his method and the success of his pupils attracted great numbers. For a while he taught in New York and Philadelphia, then he returned to England and taught Greek, Latin, French, German, and Italian to many thousands, both privately and in classes, till he realised a considerable fortune. He issued a number of books compiled on his method, and in which passages from the works of classical and foreign authors are given with interlinear English translation. Some have criticised the method of Hamilton as addressed too much to mere memory. Hamilton has been followed by others, who have made great improvements, notably W. Prendergast in his *Mastery Series*. Hamilton's system was, after all, but a practical application of the method recommended two centuries before him by Roger Ascham.

Hamiltonian Method. *See* HAMILTON, JAMES.

Hartlib, Samuel. *See* MILTON, and PETTY, SIR WILLIAM.

Harrow. *See* PUBLIC SCHOOLS.

Harvard. *See* UNIVERSITIES.

Haüy, M. *See* EDUCATION OF THE BLIND.

Head Masters (Qualifications of). *See* SCHOOL MANAGEMENT.

Hebdomadal Board. *See* UNIVERSITY REFORM.

Hedge Schools.—Under the terrible Penal Laws by which Ireland was coerced in the last century, instruction in the Catholic faith, or by Catholic priests, was prohibited under pain of death. In spite of the terrible persecution and prohibitions to which they were subjected, however, the priests carried on instruction of the people with remarkable courage and heroism. 'They were active,' says Mr. J. H. M'Carthy, M.P., in his *Ireland since the Union*, p. 13, 'in offering to their scattered flocks that education which the harsh laws denied them. On the highway and on the hillside, in ditches and behind hedges, in the precarious shelter of the ruined walls of some ancient abbey, or under the roof of a peasant's cabin, the priests set up schools and taught the children of their race. With death as the penalty of their daring—a penalty too often paid—they gave to the people of their persecuted faith that precious mental food which triumphantly thwarted the efforts of the Government to brutalise and degrade the Irish Catholic off the face of the earth. In those "hedge-schools," as they were called in scorn, the principles of religion, of morality, and of patriotism, were kept alive, and elements of education, which are the life-blood of national existence, freely dispensed. Eagerly as it was given, it was no less eagerly sought for. The readiness of the priests to teach was only equalled by the readiness of the people to be taught. The proudest place of honour in Irish history belongs to those hedge-schools and their heroic teachers. But for them the national cause and the national existence would have withered away under the blighting curse of the Penal Laws. From those hedge-schools came some of the brightest ornaments of modern Irish history. That great Churchman who died a few years ago passed his childhood under the shadow of the Penal Laws. John MacHale, Archbishop of Tuam, received at a hedge-school those early lessons which developed into that ecclesiastical scholarship and profound piety which would have done honour to the proudest epoch in the history of the Church of the West.' The hedge-school master has also played a prominent part in the history of Indian education (*see* LAW (EDUCATIONAL), sect. 'India').

Hegel, Georg Wilhelm F. (*b.* Stuttgart 1770; *d.* Berlin 1831), was educated at Würtemberg and Tübingen. He was a fellow-student with Schelling, who long exercised a great influence upon Hegel's philosophy. After acting for some time as a private tutor in Switzerland and Frankfort, he became possessed of a small property by the death of his father, and was able to give up his tutorship, and take up his residence at Jena, where he published his first work, and became acquainted with Goethe and Schiller. Here also he was a lecturer, with four listeners. When, however, Schelling left Jena, Hegel was appointed his successor. He only held the chair for one year, for, as he was writing the close of his *Phenomenology of*

Mind, Jena was stormed by the French. He quitted Jena and went to Bamberg, where he edited a newspaper, till 1808, when he was appointed rector of the Gymnasium at Nuremberg. In 1816 he was called to the chair of philosophy at Heidelberg, and in 1818 was invited to the chair at Berlin, where he continued till his death by cholera. It would be out of place here to attempt to give an account of the Hegelian philosophy—a kind of idealistic pantheism—which has exerted so powerful an influence in Germany. We have only to refer to his work as a practical educationist. At Nuremberg, where he was for some time rector, his rules and his discipline still largely obtain. An idea of his position may be gathered from some of the fragmentary expressions to be found in his writings, as: 'Teaching is the art of rendering man moral;' 'It is especially the mission of the State to render attendance at elementary schools compulsory.' In Hegel's eyes Greek was the foundation of all higher culture. He insisted upon a close study of the classics, and maintained that the study of these languages and their grammar was in itself an instrument of high intellectual culture. He made religion the principle of all education, and the foundation of all instruction. Hegel's views on education and instruction may be found scattered amongst his voluminous writings, especially in the *Encyclopädie der Wissenschaften*, and the *Gymnasialreden*.

Height of Children. *See* GROWTH OF CHILDREN.

Herbart, Johann Friedrich (*b.* 1776; *d.* 1841), an eminent German educationist and philosopher, was born at Oldenburg, where his father held the position of *Justizrath*, and was educated at the Oldenburg gymnasium and the university of Jena. Young Herbart was intended for the law, but he eschewed it, and gradually directed his attention to the study of philosophy and the science of education. The works of Leibnitz and Kant formed his introduction to philosophy, and at Jena he had personal relations with Fichte, whose *Wissenschaftslehre* (Theory of Science) awakened in him a spirit of opposition, as is evidenced by his critique on the first two works of Schelling. In 1797 he accepted the position of private tutor at Berne, in Switzerland. During the next four years he made a study of the pedagogical works of Pestalozzi, whom he visited at Bingdorf in 1799. In 1800 he returned to Germany, and, after a brief residence at Bremen, settled at Göttingen. Here, until 1809, when he accepted a call from Königsberg as *professor ordinarius* of philosophy and pedagogy, he published the first results of his mature thought. Among these may be mentioned *Pestalozzi's Idea of the A B C of Observation Scientifically Treated* (1804), *Universal Pedagogy* (1806), and the *Principles of Metaphysics* (1808). In Königsberg he divided his time between his own researches, his academic duties, and work as a practical teacher in directing a seminary of teachers founded at his instance, and held after 1812 in his own house. In thus uniting under his own roof the advantages of school and family, Herbart endeavoured to utilise the powerful influence of each by making them supplement and assist each other. His ideal was education in the family, guided and assisted by the counsel of an experienced and a professional teacher, and his ideal method embraced brevity and vividness. In 1833 he accepted a call to Göttingen, where in 1841 his studious and uneventful life came to a close. Shortly before his death he published a *Plan of Lectures on Pedagogy* (1841). Pedagogics is, according to Herbart, closely connected with ethics and psychology, and really depends upon both. He divides the complete work of education into discipline (*Regierung*), instruction (*Unterricht*), and dialectic training (*Zucht*). These are necessary since the child has no ability to concentrate the action of his organs upon one object to the exclusion of the rest, and since his individual will is the result of practice. It is the office of discipline to keep order and to subject the naturally unruly inclinations of the individual. Such subjection, however, can only be effected by a power strong enough, and acting so frequently as to be completely successful, before indications of a genuine will persisting in wrong are exhibited by the child. But all discipline must cease before training ceases, and should as soon as possible be relieved by the latter. Instruction must be educative. The aim of instruction should not be solely, or even predominantly, the amount of knowledge; nor should it be the acquisition of merely technical skill, but culture of the personality. Dialectic training embraces all

direct action upon the disposition of the pupil which is prompted by the intention to purify and supplement his energies and to lead him towards objective liberty. It has thus to deal with the character of man. Character manifests itself by individual preferences and is twofold, either objective or subjective. The objective factor of character consists of the individual's particular construction of inclination, indicated by the relative proportion of action, and the subjective in the enjoyment of complementary opposites, criticising the individual inclinations. Indeed, the great problem running through the whole of Herbart's writings on educational science is—how to realise the five ideas of freedom, perfection, right, equity, and benevolence within the province of education. Herbart's philosophy was in great part a protest against the idealistic systems founded on Kant by Fichte and Hegel. His works have been collected in twelve volumes, and edited by his disciple Hartenstein (1850–52).

Herder, Johann Gottfried von (*b.* Mohrungen, 1744; *d.* 1803), sometimes called the German Plato, became in 1764 assistant-teacher in the school of the cathedral at Riga, and preached there. He subsequently became acquainted with Goethe, and in 1775 was appointed professor of theology at Göttingen. He spent his last years at Weimar. Richter often saw him, and has left us some pleasing sketches of him. He was appointed inspector of schools at Weimar, and carried out many important practical reforms, and caused new institutions to be founded, so that he takes an important place in the history of German education. In his *Ideal of a School* (an appendix to his *Sophron, or Collected School Speeches*) he sketched a plan of studies. He divided his ideal school into two parts —the school proper or practical (*Real*), and the school of languages. The former he divided into three classes. In the 'School of Language' he rose against the excessive importance attached to Latin, and placed French very largely in its place. In this latter idea perhaps he stands alone amongst German educationists. He made three divisions of French, according to the age of the pupil. He said Latin should follow French, and Greek follow Latin. When, however, in 1783 he was required to furnish a plan for the reorganisation of schools, he did not proceed according to this theory.

Heredity (Law of).—By this is meant the tendency of peculiarities, physical or mental, to transmit themselves from parent to offspring. This may show itself in a more general and uniform manner, as in the transmission of the typical characters of the species, or of some variety of that species, as a particular race of mankind. Thus, the English child may be said to inherit all that is distinctively human as well as the more special traits, physical and mental, which distinguish our particular race and national type at its present stage of development. More commonly, however, heredity refers to the handing down of more special and variable characters in particular families. Thus, children frequently inherit peculiarities of bodily structure, as features, of bodily action, as gesture, together with well-marked mental and moral peculiarities. It is not yet known how far the action of this principle extends, and what proportion of the peculiarities which make up what we call individuality are referable to it. According to the doctrine of evolution the results of habitual modes of action of ancestors tend to transmit themselves by heredity to posterity (*see* EVOLUTION). Viewed in this way heredity corresponds in the development of the race to the laws of memory and of habit in the smaller domain of individual growth; it is the conservative force by which the race retains all useful acquisitions, organising them into perfect habits or instincts. The study of the laws of heredity is useful to the educator as helping him not only to account for, but to anticipate, family traits, and also as accustoming him to look upon his work as subserving not merely the education of the individual but of the race. (*See* Th. Ribot's work, *Heredity*.)

Heuristic Method. *See* METHOD.

Hibbert Lectures. *See* PRELECTIONS.

Hieronymites. *See* RENAISSANCE.

Higher Grade Schools. *See* CLASSIFICATION.

Historical Novels.—Teachers have found that the history work of a school is considerably freshened and enlivened if, when any period is being treated, care is taken to let the pupils know what are the best novels and tales which relate to that period, and to persuade the pupils to read them. The little harm which the fancy and invention of the writer may do—noteworthy perhaps in the case of adult stu-

dents, but hardly perceptible in the case of children—is amply compensated for by the extra brightness of interest which is sure to be gained. To interest beginners in the work which they are just entering is, after all, the main thing; a thoroughly scientific inquiry may come afterwards—it certainly will not come before. Moreover, the 'sportive instruction' afforded by a novel does not absolve the pupil from the necessity for real exertion. It will rather, when the interest has been created, not only facilitate, but even necessitate, the strongest exertion on his part; particularly if the teacher is careful to start with his pupils a discussion of one or two of the novels read. In order to help teachers in this matter a descriptive catalogue of historical novels and tales has been compiled by Mr. H. Courthope Bowen, and published by Mr. Stanford, 55 Charing Cross, S.W.

History (the Teaching of).—In the teaching of history, as in that of every other subject, it is necessary for us to begin by deciding why we teach it. Do we seek to produce a scientific, well-reasoned knowledge of humanity—at least of civilised humanity? As far as school is concerned we can only create a desire for this knowledge; we can render our pupils capable of gaining it hereafter; and in the latest periods of school-life we may even enable them to begin to acquire it. Are the facts of history in themselves of direct utility? We must answer, Seldom or never. Can the subject be used to train the mental faculties? Yes, all of them; but in especial the imagination and the higher sentiments. Probably the most valuable results of the teaching of history at schools are the love of fatherland, an interest in humanity, and a delight in all those nobler feelings classed under the head of ethic or moral sentiments. Then must follow questions as to choice of subject-matter and method. Should we begin with English or with universal History? The people about whom children are most readily interested are those with whom they come in contact—who in some way influence their lives; who bear names familiar to them; who dwell or have dwelt at places they know, or know at least by name. The things they care about are those which they can see and touch; which they can be enabled readily to imagine; which can be connected in some way with them and their lives. For these reasons it is best for English children to begin with English history. But they should not stop there. In the later stages they should proceed to acquire a general knowledge of universal, or at least of European, history. On the continent almost every country begins with national history; and only very few schools have followed the example of the Seminary School of Berlin, and started their curriculum with biographical sketches from universal history. Portugal and France are the only countries whose codes recognise universal history. It is set down as a subject for the later periods. At the great public schools of England English history is almost wholly neglected—at least on the classical sides—epitomes of the histories of Greece and Rome taking its place; the modern sides, however, generally add English history to these, and occasionally glimpses of continental epochs. The next question is: Should we begin with the present and work back to the past, or continue to use a plan the reverse of this? There is much to be said for both views. This at least is agreed to by all, that the teacher when planning his lessons should himself work back from the present to the past, and should be always keenly alive to the great questions of the day, both at home and abroad, and to the bearing of the past upon them. On the whole it seems that though the present should always be the goal to be aimed at and reached by our pupils, it is better for them to begin with the past and to work up to and into the present. Events of to-day are too complicated, too unfinished, too out of perspective for children to properly appreciate their value and meaning at first. They want something less crowded and varied, with clearer outlines, with a more decided beginning and end. A child's interest, however, is in the present, and the past is only interesting to him by its connection with the present, and as food for imagination and feeling. Should we begin with skeleton outlines to be gradually filled in, or take epoch by epoch? Neither plan is quite satisfactory. It is waste of time to learn the outlines of anything which is itself still unknown. At best the memory only is exercised, and that at considerable disadvantage. The study of epochs is apt to produce scrappy and discontinuous knowledge, while attention is directed to matters of secondary import-

ance within the epoch instead of to others of primary importance without it. It would seem best to combine the advantages of both plans by choosing a series of the most remarkable personages and events stretching from some point in the past down to the present; to treat these more and more fully in successive stages, connecting them in each stage by a brief narrative; and to fill in the interstices more and more in each successive stage with events and persons next in importance—the continuity and oneness of the whole history being carefully kept up in every stage. Should the subject-matter be political or social? Although university professors may decide upon the former for their adult students, school-teachers will answer, 'Both.' They will not enter much at first into treaties and constitution; they will be moderate in the use of 'drums and trumpets,' and, while eschewing wide generalisations and vague abstractions, they will attend most to what illustrates and reveals social character and life. The details of politics and constitutional matters are interesting to children in the last stage only of school-life. The teacher will find the following division into stages useful: In the first stage what interest children most are: action, personal adventure, personal characteristics. Let everything be striking, dramatic, single—not complicated with argument or reflection; with not too great a variety of interests. In the second stage children will want to know something of why and wherefore, and will be capable of maintaining more than one interest at a time. We may begin to criticise actions and character, and to look for causes and consequences of events. Individuals will cluster into classes, as classes will hereafter cluster into the nation. We may begin to sketch the first ideas of a State; and to get first ideas of public duty; and a curiosity as to what other nations were doing and thinking about at the time may be started. In the third stage all this will advance a step. We may now treat of the nations as a whole; enlarge and continue the ideas of a State and of public duty; touch upon the greater matters of constitutional history; inquire more into the doings of foreign nations; and gain larger and clearer views of social growth and progress.

Holland (Universities of). *See* UNIVERSITIES.

Holloway College. *See* EDUCATION OF GIRLS.

Home and Colonial School Society.—The founder of this society was Mr. John Stuckey Reynolds, a distinguished civil servant. After filling in succession many important offices in the Treasury, he retired in 1835, and thenceforth devoted his whole time to the religious and philanthropic work which had till then been the occupation of his leisure. His interest in the establishment of infant schools brought him into contact with Dr. Mayo of Cheam (the chief apostle in England of the views of Pestalozzi) and with Miss Mayo. The result of their intercourse was a determination on the part of Mr. Reynolds to introduce the principles of the Swiss reformer into English schools. With the co-operation of other public-spirited men and women, in the beginning of 1836 he established the society. The committee was formed on February 23, and the institution opened on June 1. The object of the association was indicated by its original name—'The Home and Colonial *Infant* School Society.' The society was at first unsectarian. Its aim was stated in the original rule ii. to be the 'extension of the infant school system on Christian principles.' In 1841 a more definite meaning was given to the expression by the addition, after 'Christian principles,' of the words: 'As such principles are set forth and embodied in the doctrinal articles of the Church of England.' The original rule iv. ran:—'That considering it the province of the local committees of infant schools to select their own teachers, the society will educate teachers of different religious denominations if holding the fundamental principles of the Bible, and of decided piety.' Though the rules were recast in 1848, no change was made in the wording of the two quoted, and no change has been made since. A change has, however, been made in the practice of the society. At first, most of the students trained were Dissenters; most of the applications for teachers, on the contrary, came from Church schools. The committee, therefore, sent a circular to the clergy asking them to use their influence in increasing the number of Conforming candidates, and also tried to attract such candidates by inserting advertisements in the newspapers. As a consequence, the committee was able to

announce, in their Tenth Annual Report, that 'nearly three out of four now trained in the institution are members of the Establishment.' The next step was the introduction of the present plan of insisting upon candidates for admission and students in training taking the archbishops' examination in religious knowledge. This made the college practically a Church institution, though managed by a society nominally unsectarian. From the beginning the Home and Colonial differed in one important respect from the British and Foreign and the National Societies. The primary object of the older bodies was the establishment of schools, and they only opened colleges because they found trained teachers essential to the success of their schools; on the other hand, the primary object of the younger body was the provision of teachers specially prepared to educate infants, and it left the establishment of schools to the enlightenment of managers. The society's students were originally male and female. Single men were not refused, and married couples were particularly invited. The number of single men trained was always insignificant, and the eleventh report states that the supply of married couples was greatly diminished. Soon afterwards it ceased altogether, since when only mistresses have been trained. It was in 19 Southampton Street, Holborn, that the society began its operations in 1836. Next year a house was taken in Gray's Inn Road, with a large stable at the back. The stable was converted into a school, and the house (the middle one of the nine now occupied by the institution) became the nucleus of a college. The society saw clearly that if training is good and necessary for the teachers of the poor, it is equally good and necessary for all other teachers. The First Report dwelt on the desirability of forming a class for the instruction of nursery governesses and teachers for infant schools of a superior social grade, and the Fourth announced that an adjoining house had been taken and a separate department established for this branch of the work. The two departments have gone on side by side ever since, and it will thus be seen that for nearly forty years the Home and Colonial School Society was the only institution which offered even the rudiments of professional training to secondary teachers. In 1839, when the Education Department was established, the society carefully considered the question of State aid. 'Without entertaining any very strong feeling on the question of parliamentary interference with education,' the committee reported: 'The majority of the committee would certainly have wished that the Government should have confined its plan to the manufacturing districts until it had been ascertained what the public, interested as it is now, could have accomplished, and they are more inclined to this opinion from the doubt they entertain whether any government would be disposed to give to the people an education as decidedly religious as this committee would deem indispensable.' In 1843 the committee asked the Department 'to direct an examination to be made into the system of education pursued' by the society, and Mr. Seymour Tremenheere accordingly visited the establishment. His report describes the state of the institution, and speaks (generally with approval) of the method of training, which, if not the best possible, was perhaps as good as could be expected under the circumstances. When the famous minutes of 1846 were issued the grants to colleges induced the committee to apply for Government aid. The application was preceded by mature consideration on the part of the society, and followed by considerable correspondence with the Department; but the Twelfth Report announced that thirty 'Government students' would be trained for a year or more. The next Report stated that the plan was working well, and it was extended gradually till it embraced the whole of the 'Government department.' To the Revised Code of Mr. Lowe the society offered long and uncompromising resistance. Of the Act of Mr. Forster, the society, on the whole, approved. The 'Government department' of the college at present provides accommodation for a hundred and forty students. Connected with it are four schools—a model infant school; a model and practising school for boys and girls in Standards IV.–VII.; an upper practising school for boys and girls in Standards II.–IV.; and the Reynolds practising school for boys and girls in Standards I.–IV. The 'Non-Government department' offers accommodation for an indefinite number of students. Connected with this department is a middle-class school

Home Education.—By this term we mean the instruction and training of the young in the house of their parents, by the parents themselves and by tutors and governesses. The advantages of such a plan are: the greater individual attention (as to mental powers, temper, physical health, &c.) which each child may receive; greater security from evil influences, physical, intellectual, emotional, &c., which may be provided; greater room and opportunity for individual development of powers, tastes, &c.; less publicity, more quiet, more gentleness, and the possibility of a closer and more constant intercourse with parents and brothers and sisters. The disadvantages, however, even in the best of homes, are great; and in ordinary homes are almost overwhelming. At home, even when the family is large, there is great danger of there being too much superintendence and interference. The child has less incentive to exertion, less opportunity for measuring himself or herself than at school. The general stimulation of numbers, the mutual education of those of like age, is lost. The ethical training produced by companionship with, and interests and responsibilities in common with, those who are not related to or connected with the child, and come from a distance—of all that may hereafter produce social and civic virtue—is missed. The *self* of the child is too prominent an object at home, and the discipline at home is apt to lack sound experience and to be fitful and uncertain. The play of childhood, which is now recognised as a valuable part of a child's training, requires numbers for its full, healthy enjoyment. The teachers employed at home are likely to be much inferior in skill, learning, and experience, and less varied in accomplishments. At school everything is arranged and continuously conducted for the special benefit and training of children; while at home this can rarely or never be the case. The children at home are liable to too constant intercourse with adults; are exposed to dissipations, distractions, irregularities of all kinds; and are likely to be thrown too much with servants, who, though kindly and worthy in many ways, are neither well-educated nor skilled trainers of the young, and are prone to 'spoil' them. The peculiar prejudices, narrownesses, &c., of the home and family are almost certain to be left uncorrected, and even to be emphasised. Other points might be mentioned; but enough has been said to show that true wisdom lies in carefully apportioning the time of the young between school and home; and that education requires the co-operation of *both*. (*See* article on ROMAN EDUCATION. Also Miss C. M. Mason's *Home Education*, and Dr. Abbott's *Hints on Home Teaching*.)

Home-Lessons.—This is the name given to the work which a day-pupil is set to do between the final dismissal of the school in the afternoon and the hour of reassembling next morning. It may consist either of written work or of learning from a book; and this work may take the form of either the practice, application, completion, revision of lessons previously given; or it may be preparatory to lessons yet to come. Except when written it is mainly an exercise of the memory. The younger the child the fewer and shorter should the home-lessons be, and the less should they take the form of preparatory work. It is very doubtful whether an ordinary child under the age of nine can ever properly prepare new work except while under careful guidance and supervision. For children in a day-school under this age, therefore, it is generally wise to devote the last hour of afternoon school to what would otherwise be 'home-lessons.' Few homes, except of the comparatively well-to-do, can provide the children with the isolation and supervision which home-lessons require; and even when these are provided, if the lessons are not very short there is no time left for free intercourse between parents and children. Moreover, in schools where the teaching is really good, and where the boys and girls play heartily, pupils are generally too tired in the evening for much mental effort. In a day-school where the hours are from 9.30 a.m. to 4.30 p.m., home-lessons for normal pupils under ten should never exceed one hour, for those between ten and thirteen, one hour and a quarter, for those between thirteen and sixteen one hour and a half. The work done as 'home-lessons' should be tested and corrected without fail on the following day. Its subjects should, therefore, be taken from those of that day, and the correction or testing of the home-lessons should occupy the first part of the divisions of time set down to those subjects on the time-table. In the case of written work, the teacher

will, of course, have to inspect and mark it afterwards as well. Exercises should be corrected orally in class as soon as possible after they have been written : the marking (with red ink or chalk) of the mistakes made may come later. In very large classes it is easier to make sure that *written* home-work has been done than that lessons have been learnt. But, on the other hand, the correction of this written work may become very burdensome. This again points to the necessity of care as to the kind of work chosen and of moderation in the amount set.

Honour.—The thirst for distinction or honour is a powerful motive in the young, and is directly appealed to in education, not only by the whole system of scholastic rewards and distinctions, but by the organised system of physical contests that grows up in the playground, &c. As an intense degree of the love of reputation, ambition to gain honours is specially open to the objections that may be urged against this motive in general. The term 'honour' has come to have a special ethical significance. In addition to the common rules of right and wrong which bind us all, special rules, known as 'codes of honour,' are adopted by particular classes of the community, or coteries, for the purpose of maintaining their dignity and reputation. As we see in the case of duelling, such laws of honour are often mischievous, as overriding the plain dictates of morality. The formation of a standard and rules of honour by every community of school-boys is a valuable supplement to the moral discipline of the schoolmaster. At the same time the tendency to impose a code of honour in the playground and classroom must be carefully watched, lest it tend to pervert a boy's notions of moral distinctions. The schoolmaster can help to form a higher notion of the claims of honour by throwing a boy on his honour, as, for example, when allowing him to go out of bounds. An appeal to the feeling of honour in this way, which was often resorted to by Dr. Arnold, may prove the most effectual way of inciting a boy to moral effort, by encouraging him to act worthily through another's belief in him. (*See* Schmidt's *Encyclopädie*, article 'Ehrgefühl.')

Hoole, Charles (1610–1666), an eminent schoolmaster in his day, and the author of at least twenty-four educational works, was born at Wakefield in 1610. From the free school of his native town he passed to Lincoln College, Oxford, where he earned a reputation for scholarship in Latin, Greek, Hebrew, and Philosophy. After taking his B.A. degree, he began teaching in 1633 in Lincolnshire, and subsequently at Rotherham, where he speedily became known as a skilful schoolmaster. About the year 1649 he was invited to London by several noted citizens to start a private grammar school —first in Redcross Lane, and two years later in Token House Garden in Lothbury, near the Royal Exchange, where, according to Wood, 'the generality of the youth under him were instructed to a miracle.' He afterwards moved to the grammar school of Monmouth on the urgent request of some of his old London patrons ; but, being dissatisfied with the result, he accepted a prebendship in the church in Lincoln offered him by his kinsman, Bishop Sanderson, and soon after became rector of Stock Billerica, near Chelmsford. Here he died in 1666, and was buried in the chancel of his church.

Hoole laboured hard and wisely to improve the education of his day, not only by his works on school management and the art of teaching, but also by composing and publishing several good class-books, of which perhaps the best was his *Grammar in Latin and English in Four Parts* (1654), which ran through several editions. But better still than this, he saw and appreciated the value of the works of his contemporary Comenius. He translated and published in 1659 both the *Orbis Pictus* and the *Janua* ; and in the preface to the former made many excellent remarks on object-teaching. Amongst other things, he said : 'To exercise the senses well about the right perceiving the differences of things will be to lay the grounds for all wisdom and all wise discourse. . . . Descend to the very bottom of what is taught, and proceed as nature itself doth in an orderly way ; first to exercise the senses well by representing their objects to them, and then to fasten upon the intellect by impressing the first notions of things upon it, and linking them one to another by a rational discourse. Missing this way we do teach children as we do parrots, to speak they know not what.' He would have the *real* objects presented to the children whenever they are mentioned. He be-

seeches those that have the care of little children 'not to trouble their thoughts and clog their memories with bare grammar rudiments, which to them are harsh in getting and fluid in retaining; because, indeed, to them they signify nothing but a mere swimming notion of a general term, which they know not what it meaneth till they comprehend particulars.' There is much else to a like admirable effect. Hoole's four best known works—all published in 1659—are *The Petty School*, *The Usher's Duty*, *The Master's Method*, and *Scholastic Discipline*; the last of which is especially valuable for its originality and good sense, and for the light it throws on the actual school education of his time. They will be found reprinted in Barnard's *English Pedagogy*.

The Petty School deals with education between the ages of four and eight; and in it Hoole describes several devices of a Kindergarten kind for getting a child to learn its letters in play. He is a firm believer that 'It is as natural for a child to learn as a bird to fly or a fish to swim'; and if discouragements are carefully removed, and everything is done cheerfully, the child will learn with delight. He insists on English coming before Latin; and strongly recommends fair writing and arithmetic. The master is to take great care to distinguish 'betwixt those faults that are viciously enormous and those that are but childish transgressions.' *The Usher's Duty* deals with the lower half of the grammar school. Its views may be summarised as follows: Begin with English grammar, so that the boys may understand the parts of speech and their relations to one another. Get a vocabulary of Latin as soon as you can by the help of some such book as the *Orbis Pictus*—practice constant repetition of what has been learnt—let the rules of grammar as far as possible be learnt by practical experience, regularities first, irregularities afterwards as they arise—use translation (with special vocabularies, not dictionaries) and retranslation largely and often after the manner of Ascham (*q.v.*) and Brinsly. *The Master's Method* treats of the work of the three highest classes of the grammar school, viz., the Latin, Greek, and Hebrew. English verse is practised before Latin verse; and we are told significantly that the schoolmaster's aim is 'to teach languages, oratory, and poetry as well as grammar.' This book—like his others—is rich in references to school-books of the day and to books on methods. *Scholastic Discipline* relates Hoole's experiences at Rotherham and elsewhere, and his views on general school management, school buildings, class-rooms, rewards, and punishments, &c. It is full of historical interest and sound suggestion. Many of its wisest proposals have not even yet been realised.

Horn-book. *See* CRISS CROSS ROW.

Horner's Method. *See* ARITHMETIC.

Hullah, John. *See* SOL-FAING.

Hulsean Lecture. *See* PRELECTIONS.

Humanities.—The Romans gave the title 'humanitas' to the study of letters and the liberal arts, since by these man distinguishes himself from other animals and raises himself to the true dignity of his nature. Aulus Gellius (xiii. 16, quoted in the *Dictionnaire de Pédagogie*) says: 'Humanitas, that is, instruction in good arts, the which whosoever truly take to and seek after are in very deed most human. For the caring for this knowledge and its discipline out of all living things is given to human beings only; and therefore hath it been called *humanitas*.' The first and the chief leaders of the Italian Renascence called themselves 'humanists,' and the name was adopted elsewhere. Later on the term 'humanities' was used in colleges and universities to signify that part of the studies which includes all that is, strictly speaking, literary and classical. In this sense the term 'humanists' has often been used, from the seventeenth century down to our day, in contradistinction to 'realists'—the name given to champions of the study of *things* (instead of *words*) and of physical science generally. The term 'Professor of Humanity' is still used in the universities of Scotland, as equivalent to Professor of Latin. *See* MIDDLE AGES (SCHOOLS OF).

Hygiene of School Life.—The subject of health in relation to school life naturally divides itself into that of *healthy schools* and *healthy scholars*. Under the former head the reader should refer to articles on ARCHITECTURE OF SCHOOLS, VENTILATION, TEMPERATURE OF AIR, IMPURITIES OF AIR, DORMITORIES, WARMING APPARATUS, SANATORIUM; under the latter head refer to articles on OVERPRESSURE, PHYSICAL EDUCATION, RECREATION, SEX, SMOKING, EYESIGHT, EPIDEMIC DISEASES, COMMUNICABLE DISEASES, SLEEP, SCHOOL SURGERY.

I

Illustration in its most comprehensive meaning is the rendering of an idea or truth clear to another mind. This is effected by setting what is presented in a relation of likeness to some known thing, and so promoting the process of mental assimilation. Hence all illustration proceeds by connecting by some link of similarity, affinity, or analogy, what is new and obscure with what is old and familiar. Illustration may be employed in the description of some concrete object, as in the use of illustrative analogies in setting forth geographical or historical facts. It is chiefly required, however, in expounding all abstract ideas and principles. Here intelligibility depends upon a selection of suitable examples or instances which may serve to exhibit the abstract idea in a living concrete form. This illustration of the general rule by the particular case may be regarded as an extension of the inductive method, which proceeds by leading a child to grasp a general principle through a comparison of particular instances. (*See* METHOD.) It may be added that illustration, though it commonly refers to bringing out points of similarity, includes the setting forth of contrast as well. (*See* CONTRAST.)

Imagination is the name of that faculty or power by which we form or make a mental representation of a concrete object which is not presented to the senses at the time. It may be popularly defined as the power of mentally picturing things. If this picturing means the recalling to mind of something which we have actually seen, it is known as Reproductive Imagination, whereas if it means the formation of a new mental image it is known as Constructive Imagination. It will be seen from this definition that imagination is exercised not merely about the fictitious creations of poetry and art, but about common realities. The cultivation of the imagination thus subserves two main ends, knowledge and æsthetic delight. The first is illustrated in the teaching of concrete subjects, as geography and history, where the pupil is required to reproduce the impressions of his past experience, with a view to constructing images of the new objects, scenes, and events, described by the teacher. It is further illustrated, though in a less obvious way, in science-teaching, the abstract principles of which can only be reached by preliminary processes of imagination. The cultivation of the imagination for æsthetic purposes is carried on in close connection with the development of the feelings and the taste. Here the object of the educator should be to render the child's mind sensitive and responsive to what is beautiful, pathetic, or sublime in the poet's creations, so that his imagination may be stimulated to a vivid realisation of the same. The imagination is commonly included among the faculties which are strong or highly developed in the child; yet it is important to distinguish between the random, unguided movements of childish fancy and the orderly progress of a trained imagination (cf. CONSTRUCTIVE FACULTY). (*See* Sully, *Teacher's Handbook of Psychology*, chap. xi.)

Imitation is the name for the propensity or impulse to copy the actions which we see others perform. In a comprehensive sense we may be said to imitate or reproduce the modes of thought and feeling as well as the actions of others, but in mental science imitation is regarded as a principle which especially governs the actions—as where a child imitates a bodily movement or a virtuous action. Imitation is commonly spoken of as instinctive or original, but it has recently been shown that the first imitative movements occur about the end of the fourth month. This fact suggests that in order to imitate another's action, the child must have progressed a certain way in the association of the sight of a movement as executed by another, and the impulse to perform a similar movement. This association is brought about, first by looking at his own organs when in movement, and then recognising the similarity of others' movements. Imitation plays a very important part in the early development of the bodily powers. Children learn to use their limbs and their voice under the lead of others' example. The impulse to adopt the movements of others tends also to the reproduction of their emotional states as manifested in certain definite expressive movements, e.g. frowning. Besides such imitation pure-

and simple, which aims at no gratification beyond itself, there are certain mixed forms. Of these we may instance mimicry, which, as now understood, implies the gratification of the feeling of the ludicrous, a childish propensity which needs to be kept within proper bounds; and that emulative form of imitation which is a conspicuous feature in all kinds of youthful contests. Imitation takes on a more conscious and dignified form in all deliberate attempts at copying what is felt to be worthy in the sentiments and conduct of others. This kind of imitation, which is correlated with what we call the force of example, is one of the chief aids to moral education. The influence of companions, and of the personality of the parent and of the teacher, owes its moral significance to the operation of the principle of imitation. This often works unconsciously, as where a child passively adopts the manners and even the feelings and motives of others without any conscious effort. Imitation, however, only attains its highest moral value when the child distinctly sets up another's mode of feeling and conduct as an example, and a model for his own. Such imitative effort plays a larger part as years advance, and ought to become a powerful means of moral growth towards the end of the school period. It is in relation to the imitative tendency of childhood and youth that the teacher's personality and character become a matter of the highest moral consequence. Knowingly or unknowingly he is always acting upon this impulse, and moulding the ways of his pupil into conformity with his own. (*See* Bain, *Mental and Moral Science*, book iv. chap. ii.; Sully, *Teacher's Handbook*, chap. ix.)

Impositions. *See* REWARDS.

Impurities of Air are more likely to collect in schoolrooms than in private houses, owing to the close aggregation of children. It has been well said that 'our own breath is our greatest enemy,' and it is from this source that the most dangerous impurities arise. The air expired from the lungs contains a large excess of carbonic-acid gas. Ordinary out-door air contains four parts of carbonic acid in ten thousand of air, but in expired air this is increased to four hundred parts Five hundred children assembled in one room produce in an hour as much carbonic acid as is equivalent to the solid charcoal or carbon contained in 20 lbs. of coal. Expired air also contains volatile organic matter in suspension, which is of a highly putrefiable nature, and gives to a crowded room its characteristically close and stuffy smell. The carbonic acid is far from harmless, but this organic matter is still more poisonous and injurious to the health. The fact that expired air contains considerable aqueous vapour is another reason why free ventilation is required.

Tests for Aërial Impurities.—The sense of *smell* is perhaps one of the best; only it must be exercised after a few minutes' exposure to the open air, and before it has become blunted by staying in a vitiated air. On entering a room of which the atmosphere is impure, it will be found perceptibly stuffy if the carbonic acid in it reaches six parts in ten thousand of air, and the degree of stuffiness or closeness as perceived by the educated smell is a very fair indication of the amount of impurity present. The stuffy smell is not due to the carbonic acid, but to the organic matter associated with it. Inasmuch as the two are in fairly constant proportion to each other, and the quantitative tests for carbonic acid are much easier to apply than for organic matter, the amount of carbonic acid is usually taken as a criterion of the state of a given atmosphere. The following simple *chemical* test may be applied: Take a bottle capable of holding ten and a half fluid ounces, blow the air of the room into it by means of a bellows, pour in a tablespoonful (half an ounce) of clear lime-water, and after corking tightly, shake the bottle well. If no milkiness is produced —by the chemical combination of lime and carbonic acid producing chalk—then the amount of carbonic acid is below what is regarded as the limit of purity: viz. six parts in ten thousand of air.

Effects of Respiratory Impurities.—Wher these are very concentrated, headache, giddiness, and faintness are produced. When the impurity is less extreme there is a general lowering of the system, owing to the excess of carbonic acid and the organic matter preventing the oxidation processes of the body, and poisoning the blood. A general lassitude results, and an increased proneness to fall the victim to respiratory and other diseases. Drowsiness, languor, and yawning in schools are an indication for thorough flushing of the rooms with fresh air.

Mental work cannot be successfully carried on when the blood which supplies the brain is vitiated with impure air, and the mind is therefore kept in a sort of mental fog. Where furnaces and stoves are used *carbonic-oxide* gas is apt to get into the rooms, producing giddiness, headache, and depression of the general health. The use of *coal-gas* for lighting purposes is another common source of polluted atmosphere. Both carbonic acid and sulphurous acid are produced in the combustion of coal-gas. By the combustion of 1 cubic foot of coal-gas 2 cubic feet of carbonic acid are produced. A medium gas-burner burns 3 cubic feet of gas per hour, and therefore produces 6 cubic feet of carbonic acid, i.e. about as much carbonic acid as ten adults produce in the same time.

Inattention. *See* ATTENTION.

India (Educational Law of). *See* LAW (EDUCATIONAL).

Indian Association (National) was established under influential auspices in 1870, for the promotion of social and educational progress in India. The association (*inter alia*) gives grants in encouragement of education—especially female education—in India, for promoting the employment of Indian medical women, for selecting English teachers for Indian families, and for helping Indian teachers and students in England. There are several branches of the association in India. Hon. Sec., Miss E. A. Manning, 35 Bloomfield Road, Maida Hill, London, W.

Indian Universities. *See* UNIVERSITIES.

Individuality, so far as it needs to be considered here, may be defined as the sum of mental and moral qualities which characterise a particular person, distinguishing him from other persons. Such individual peculiarities have their conditions in the physical organism, a fact clearly recognised in the doctrine of Temperament (*see* TEMPERAMENT). According to the universal biological law, that all living forms tend to differ one from another (within certain limits), every child's brain, together with its constitution as a whole, has its own peculiar stamp from the first. And these physical peculiarities serve to determine the special mental traits, intellectual and moral. Within the limits of the typical human development every child is impelled to follow a line of development of its own. This impulse is much more marked in some children than in others. A strong individuality is an integral element in that later moral product which we call CHARACTER (*q.v.*). The educator is perhaps naturally inclined to regard individuality as an obstacle and a limitation, since in extreme cases it implies resistance to his moulding influences. Here, however, we must distinguish between individuality which involves no deviation from the normal type, and eccentricity which implies such deviation. Rightly considered, individuality is not something wrong which the educator has to correct, but one chief aim of the work of education itself. The object of the teacher should be to make a careful study of every child's intellectual and moral peculiarities, with a view to develop all that is valuable in these, and so produce a fine individual. This furtherance of individuality has to be harmonised with the development of a typically complete human being. Thus, in intellectual education we should aim at securing a certain general culture of the faculties by a common plan of study, and, at the same time, a special training of individual aptitudes by selected or optional studies. The value of individuality as an element of personal and social well-being has been emphasised by a number of recent thinkers, among whom may be mentioned W. von Humboldt and J. S. Mill. (*See* J. S. Mill, *On Liberty*, chap. iii., and the article 'Individuality,' in Schmidt's *Encyclopädie.*)

Induction is reasoning from particular cases to a general truth or principle, and so is the converse of deduction, which is reasoning from a general truth to a particular case (*see* DEDUCTION). In induction we start from experience, employing the instruments of passive observation and active experiment. Children begin to reason spontaneously by passing from particular facts or experiences to similar concrete cases. This may be called a crude or imperfect form of induction. Induction proper only begins when the mind frames a general proposition, as: 'All plants have roots.' The early inductions or generalisations of childhood are characterised by haste and want of a sufficiently wide comparison of facts and an adequate inspection and analysis of the facts observed. Scientific induction, which is concerned

with the discovery of the causes of natural phenomena, proceeds by the employment of a method which it is the special business of inductive logic to formulate. Such methodical induction is best illustrated in the so-called inductive sciences and—so far as they employ experiment—experimental sciences, such as experimental physics, chemistry, &c. The study of these sciences is, therefore, the best training in inductive reasoning. (*See* Mill, *Logic*, bk. iii. chaps. i. and ii.; or Jevons, *Elementary Lessons*, xxv. and following; Bain, *Education as Science*, p. 154, &c.)

Inductive Method. *See* METHOD.

Industrial Schools, as defined by the consolidating Industrial Schools Act of 1866, are schools in which industrial training is provided, and children are lodged, clothed, and taught. They are really schools for the reclamation of juvenile vagrants, and the neglected children of criminal parents. Any child found begging, or wandering homeless or destitute—whether an orphan or having one or both parents in prison; or living in the company of thieves and prostitutes; may be taken by any person before a magistrate, who may order the child to be sent to a certificated industrial school. Refractory children whether in the workhouse or in charge of parents or guardians may also be sent by the justices to such a school, as may also children under twelve on conviction for a criminal offence. Provision is made for sending the child, if possible, to a certified industrial school controlled by the religious denomination to which the parents or guardians belong. There are also day industrial schools for children whom it is not thought desirable to send to the ordinary elementary schools. Parents, if able, are required to contribute to the maintenance of children during their detention in industrial schools, which are mainly supported, however, by contributions from the Treasury, the local rates, and private individuals and societies. (*See* TRUANT SCHOOLS.)

Infant Schools. *See* YOUNG CHILDREN (EDUCATION OF), HOME AND COLONIAL SCHOOL SOCIETY, and CLASSIFICATION.

Infectious Diseases of School Life. *See* COMMUNICABLE DISEASES.

Inspectors of Schools.—The appointment of Government Inspectors of Schools in the United Kingdom dates from 1839, when Parliament voted 30,000*l.* to assist in the work of erecting and enlarging schools. The duty of the inspectors at first consisted in seeing that this and subsequent building grants were properly appropriated. It was not until 1846 that a regular system of examining and reporting upon schools receiving Government aid was instituted. This was the year of the celebrated Minutes under which augmentation grants to teachers for pupil-teachers were made, and the QUEEN'S SCHOLARSHIPS (*q.v.*) instituted. Still greater importance was attached to the work of inspection in 1853, when capitation grants (*see* GRANTS) were first voted by Parliament. Another memorable date in the history of school inspection is 1861, the year of the CODE (*q.v.*) drawn up by Mr. Lowe (afterwards Lord Sherbrooke) as the result of the report of the Duke of Newcastle's Commission. The report urged that the only way to secure the efficiency of elementary education was 'to institute a certain examination by competent authority of every child in every school to which grants are to be paid, with a view of ascertaining whether those essential elements of knowledge are thoroughly acquired, and to make the prospects and position of the teachers dependent to a considerable extent on the results of the examination.' Inspectors were appointed to carry out this recommendation. Though the system of inspection under the Code is much more rigid than under the Minutes of 1846, the inspectors under the former have been relieved of much of the responsibility which was imposed upon the inspectors under the latter, who were required to give their opinions upon the religious as well as the intellectual merits of each school. It is now no part of the duty of the inspector to inquire into any instruction in religious subjects. Various objections have been raised, however, against the present system, and especially against the practice which prevails in England, Scotland, and Wales, though not in Ireland, of appointing inspectors, without requiring them to give conclusive evidence of special qualification for the duties they have to discharge. In Ireland candidates for the office of inspector of schools are required to give proof of their knowledge of the theory and practice of education, and of school management, by examination as well as by a subsequent course of probation under a chief inspector. In the rest of the United Kingdom, however,

this precaution is not taken, and official favouritism and political exigency have much to do with the appointments of inspectors of schools. Elementary teachers themselves are not eligible for inspectorships, though Mr. Matthew Arnold, Dr. Fitch, and other important witnesses before the Education Commission of 1887, gave evidence in favour of appointing successful teachers. Mr. Matthew Arnold expressed the opinion that the great bulk of inspectors might with advantage be drawn from the ranks of elementary teachers, as they are in France, Germany, Switzerland, Belgium, and indeed almost every European country. Mr. Arnold further expressed his preference for the Continental system of inspection generally, inasmuch as it is not so mechanical as our own. The Continental inspectors merely have to see that the law is observed, that the school programme is carried out, and that the teachers do not neglect their duty, but they have little or nothing to do with the examination of the children.

Instruction (from the Latin *instruere*, to build up or form) means the informing of the mind by a communication of knowledge. It is commonly distinguished from education, which aims not so much at the distribution of knowledge as at the development of faculty or power (*see* INTELLECTUAL EDUCATION). Instruction or teaching is correlated with learning, or the acquisition of knowledge, and its methods must be determined by the conditions of this last (*see* TEACHING and LEARNING).

Instruction (Course of).—It has been stated under the article CLASSIFICATION that great convenience arises from defining the several grades of schools by the average age at which the school life of the scholar ends. So that an elementary school may be usefully defined as one in which the course of instruction is laid down for those whose school life ends at thirteen or thereabouts; and a third-grade secondary school, as one in which the course of instruction is laid down for those who leave school at fourteen or thereabouts; a second-grade, at sixteen or thereabouts; a first-grade, at eighteen or nineteen. Yet although age is the principal factor, there are other factors to be taken into account in determining the course of instruction to be pursued in each school; some external, as the social aims of the parents and the future careers of the scholars; and some internal, as the number of hours each week, and the number of years, for which a given subject can find a place in the time-table, having due regard to the claims of the other subjects. The chief thing, however, to be borne in mind is that the average age of leaving school does essentially differentiate the curriculum of a school of a particular grade, from the schools of other grades. This point needs strongly enforcing, because a popular fallacy has associated itself with the idea of the 'Educational Ladder' through the schools of various grades, from the elementary school to the university, which requires to be disposed of in the interests of the scholars for whom it is desired that that ladder should be provided. This fallacy consists in supposing that a talented child 'from the gutter' should be kept at an elementary school until he has *finished* the course there, and should then be passed on to a third- or second-grade secondary school till he has reached the limit of age for that school; and then, again, be transferred to a first-grade school to be prepared for the university. The fallacy takes another form, injurious to a more numerous, though less able, class of young persons, when it is assumed—as it is by many parents—that a boy who stays at a first-grade school until he is sixteen or thereabouts gets the same kind of education, and has been as well fitted for his future career, as if he had been under instruction in a second-grade school up to that age. But the facts are that it is almost fatal to keep a talented lad at any grade of school in the ladder until he has completed the course laid down in that school, before passing him on to the next; and it is highly prejudicial to the interests of an average boy to place him in a higher grade of school than that which corresponds to the limit of age at which it is intended that his education should cease. The misconception has arisen partly from the impression that a scholar of a given age is doing very much the same kind of work in whatever grade of school he may be; partly from inability to realise the fact that a widening of the course of instruction, according to the grade of school and increased length of school life, takes place from the very lowest class in each school upwards. The curricula of schools of various grades cannot in fact be compared to so many inverted frusta of cones piled one on the other, the base of each of

which, as you ascend, exactly fits on to the upper side of the frustum immediately below; but rather to a series of frusta, each of which starts from a wider base as the grade of the school is higher. Some of the subjects may be taught in all the grades of schools, and yet the mode of treatment of the subjects, the particular stage taught to a scholar of a given age, and the extent to which the subject is ultimately carried will vary according to the grade of school. Thus English, Latin, science, mathematics, may be taught in elementary schools and in all three grades of secondary schools. But a scholar in each of these classes of schools will be at an entirely different stage of knowledge in these subjects, at a given age. Again, a boy of sixteen leaving a first-grade or second-grade school will, in either case, have spent so many hours of school life, at Latin, for instance; but, in the first case, his knowledge, though wide, will be incomplete, as the curriculum contemplates his staying at school until eighteen or nineteen; in the other case, it will be complete for its purpose, as the curriculum was laid down with a view of giving such a course of instruction in that language as, though narrower, would meet certain well-defined requirements, possible of attainment by the leaving age. Two things follow from what has been said: first, that one subject of instruction cannot be definitely called an 'elementary' subject, and another a 'secondary' subject, for a subject may be common alike to the curricula of every grade of school: only its treatment and range will be different; secondly, that it is absolutely necessary for the effectiveness of the educational ladder that the scholar who is to be passed up it should leave the elementary school some years—probably two—before he has reached the superior limit of age for such a school, and should be transferred to a second-grade school, if it is proposed to pass him on to a scientific or engineering course at sixteen or seventeen, or to a first-grade school, if circumstances are favourable, and he shows signs of such literary or other ability as would promise him a successful career at one of the older universities. It is similarly true that, if such a scholar as this should be found at a second-grade school, he should have facilities given him for passing on to a first-grade school at thirteen or fourteen, rather than at sixteen years of age.

The question of the retention of Latin (*see* LATIN; CLASSICAL CULTURE) in other than first-grade schools in England has been mooted again and again, as in Germany in connection with the curricula of REAL-SCHULEN (*q.v.*). Up to this time the general feeling has been in favour of its retention. If this language were excluded it is certain that boys of exceptional talent would find a serious impediment to their rising to the highest education. Looking generally upon Education as the 'social bridge which unites all classes of society in England,' some have averred that 'the cement is furnished directly or indirectly by the Latin language.' It is felt, too, that the divorce of the second-grade schools and grammar-schools in small towns (which are in reality second-grade) from the medical and legal professions—both of which require Latin in their preliminary examinations—and from the universities would be a formidable price to pay for the abandonment of Latin. Up to the present time, then, Latin holds its own; and, subject to the common-sense maxim 'Either *good* Latin or none,' has justified its position. But whether it will do so always, in presence of the increasing cry for advanced technical training, and for better and more colloquial knowledge of French and German to fit English pupils to compete successfully in commerce with youths of foreign nationality, is doubtful. It is certain that the curriculum of second- and third-grade schools does not admit of any great extension in either a technical or modern-language direction, without the dropping out of some other subject; and, as the cry for this gains in intensity, it looks as though Latin would be the subject that will have to drop out. But this would mean a great revolution in English modes of thought and methods of education; and as, in general, English movements do not progress by revolution, the abolition of Latin, if it takes place at all, will probably come about very gradually. (For the course of instruction in public elementary schools in England and elsewhere *see* under STANDARDS.)

Intellectual Education is that branch of education which concerns itself with the intellectual faculties, and seeks to develop these harmoniously, and in the order of their development. This can only be effected by putting the child's mind into an attitude of inquiry in relation

to certain materials of knowledge which are presented to it, either in the shape of objects to be observed by the senses, or words to be interpreted and understood. That is to say, faculty is developed in and by the process of gaining knowledge. And to this extent the aims of instruction and education are identical.

Interest (from *inter-esse*, to be of importance) describes the effect of feeling, and more particularly pleasurable feeling, in rousing and sustaining the attention. The feeling may be the immediate result of the action of an object on the mind, as when a child is attracted by a pretty picture; or may be due to a process of association and suggestion, as when a child is interested in watching the preparation of its food. Interest is closely connected with curiosity. A child desires to know what can be known about objects that are interesting to him, such as his pet animals, his toys, &c. From this it is apparent that the intellectual educator has at the outset to seek to awaken in the child's mind a feeling of interest in the subject presented to it. This he will do partly by bringing out all that is striking, pretty, &c., in the subject, and partly by connecting it with known sources of interest in the child's surroundings. One chief aim of the instructor should be to develop new interests, answering to the different domains of knowledge to be dealt with, as history and natural science. It is evident that in order to awaken such a feeling of interest and study attention must be paid to individual differences of sensibility; cf. ATTENTION. (*See* Sully, *Teacher's Handbook*, p. 87 and following.)

Intermediate Schools. *See* CLASSIFICATION.

Intuition, Intuitive Method.—In its original and proper sense intuition is the apprehension of an object by one of the senses, and more particularly the sense of sight--in other words, the act of perception (*q.v.*). In a secondary manner it has come to mean the grasp or understanding of an idea in so far as this approximates in character to a perception of the senses. Thus the distinct imaginative picturing or realisation of any object, as a volcano, is a mode of intuition. We may thus be said to have an *intuitive knowledge* of any object or idea that we can distinctly perceive or imagine. Such intuitive knowledge is marked off from *symbolic knowledge*, e.g. that of large numbers, which does not admit of being reduced to a sensible or picturable form. From this definition it will be evident that the Intuitive method in teaching consists in reducing abstract ideas as far as possible to sensible concretes, in setting out in the exposition of any abstract notion, such as an angle, a verb, justice, with concrete illustrations addressed to the senses or to the pictorial imagination. It thus corresponds pretty closely with the Inductive Method (*see* METHOD). On the nature of Intuition and the Intuitive Method *see* Jevons' *El. Lessons in Logic*, p. 57 and following; Compayré, *Cours de Pédagog.*, pp. 265–69; Buisson, *Dict. de Péd.*, art. 'Intuition'; and Schmidt, *Encyclopädie*, art 'Anschauung.'

Ireland, Education in. *See* LAW (EDUCATIONAL).

Irish Universities. *See* UNIVERSITIES.

Italian. *See* MODERN LANGUAGES.

Italian Universities. *See* UNIVERSITIES.

J

Jabuch (School of). *See* SCHOOLS OF ANTIQUITY, sec. *Judea.*

Jacatot. *See* PAYNE.

Jahn, Friedrich Ludwig.—The father of German gymnastics, familiarly known as *Father Jahn*, *b.* 1778. He became a teacher in one of the city schools in Berlin in 1810; and published his work on *German Nationality* in the same year, which set forth his idea of making bodily training a force in national regeneration, which would bring about the realisation of his dream of a free and united Germany. His crowning work on German gymnastics (*Die Deutsche Turnkunst*), published in 1816, led to the foundation of gymnastic societies (Turnvereine) in all parts of Germany. The protest of these societies against many received customs and manners raised a cry against them, and they were suppressed in Prussia in 1820. Jahn himself was banished from

Berlin in 1825. But these Turnvereine were revived in 1842; and henceforth physical exercises were formally acknowledged in all German schools as a necessary and indispensable part of the education of the people. The great majority of the German Turnvereine, now numbering about three thousand, have been included in a large organisation with circuits, or geographical subdivisions, known as the Deutsche Turnerschaft, the object of which is to promote throughout Germany the interests of gymnastics as a means to bodily and moral strength. Jahn died in 1852. (*See* ATHLETICS.)

Jansenists (The).—This was the title given to the recluses, both men and women, whose chief retreat was the Abbey of Port-Royal, fifteen miles s.w. of Paris, and who had adopted many of the views of the learned Jansen, Bishop of Ypres (died 1638). The women of this sect lived chiefly at the Abbey and in a retired convent in Paris; the men chiefly in the neighbourhood of the former; sometimes on the farm of Les Granges, or at Chesnai, sometimes at the Château des Trous, not far off. The sect was never a large one, and suffered much persecution through the instrumentality of the Jesuits, who were completely triumphant in 1660. The last trace of a Jansenist house disappeared in 1790; but many of their religious views and most of their educational principles are still powerful in France. In the *petites écoles*, or little schools, which they established about the year 1643—but which were only fully at work between 1646 and 1656, and ceased to exist in 1660—the *Port-Royalists* (as they are often called) sought to realise Erasmus's idea of a place of education which should combine all the good qualities, and avoid all the drawbacks, both of home and of a public school. Their aim was neither to proselytise nor to make profit of any kind by their little schools; but 'with God's blessing to be of some service to little children.' Never was a more earnest, unselfish, loving endeavour made to put into practice the most liberal and enlightened views possible at the time to educational thinkers. Into their *religious* views, which were ascetic and gloomy, we cannot here enter. We shall restrict ourselves to stating some of their most marked opinions on the education of boys.

It is in the character of the teachers and of the teaching, not in any outward advantages enjoyed by the schools, that we must look for the explanation of the fame of the Port-Royalist system of education. The master-mind of the Port-Royalists was Hauranne de Verger, Abbot of St. Cyran. He had hoped to establish a church-seminary, and had thought of Lancelot as a man who had that gift, 'one of the rarest,' of fitness for the work of education. But St. Cyran fell under Richelieu's displeasure, and an imprisonment, to last till within a very few years of his death, prevented him from carrying out in person his scheme. The very intentions, however, of men like St. Cyran are worth more than the deeds of ordinary men. Those who had come under the spell of his influence seldom rested till they found means of realising the ideas with which he had inspired them. His hopes were to be realised in the *petites écoles*, whose existence, curiously, dates from the same year as that of his death. Of these schools, Lancelot was always to be, to say the least, one of the moving spirits. Both he and his colleagues were men of singular energy, piety, and devotedness. Lancelot writes to a friend, 'Il faut que les précepteurs s'estiment heureux de sacrifier leurs travaux, leurs intérêts et leur vie pour ces petits, que Dieu leur a confiés'; and this feeling that their pupils were a sacred charge lies at the root of all their character and conduct as teachers. It leads them to startling conclusions on the subject of *discipline*; it makes them memorable reformers in matters of *instruction*. The Jesuits had substituted for the old monastic régime of incessant punishment, mainly corporal, an elaborate system of rewards. Appeal to the spirit of emulation was, in fact, a leading principle of the Jesuit schoolmaster. The Port-Royalists, on the other hand, thought of this spirit as a relic of the old Adam. A striking sentence in Pascal's *Pensées* shows us how he was alive at once to the beauty of the Port-Royal theory, and to the danger in its practice: 'L'admiration gâte tout dès l'enfance. Oh! que cela est bien dit! qu'il a bien fait! qu'il est sage! Les enfants de Port-Royal, auxquels on ne donne point cet aiguillon d'envie et de gloire, tombent dans la nonchalance.' *Discipline supported by little punishment and no rewards*—this seeming like a counsel

of perfection. Yet Pascal's hint at the failure in practice is not, so far as we know, borne out by the facts of the case. In estimating its probabilities, too, it must be remembered that there were never at one time, and perhaps not in the whole sixteen or seventeen years during which the schools lasted, more than fifty pupils; that each teacher seems to have been responsible for only six pupils; and, above all, that Port-Royalist scholars, as well as teachers, were choice spirits: the pupils were sent to these schools on no conventional grounds, but because their parents *believed* in the system.

Yet even more interesting than the discipline is the instruction of these teachers. Like the Jesuits, they treated the Humanities as at once the root and the flower of their education. But there was an immense difference in the methods pursued. The Jesuits taught the classical languages mainly through books of extracts; the Port-Royalists preferred to read the authors themselves, or, at least, large portions of them. The phrase-books, which had been introduced by the Jesuits to help their scholars while struggling with the difficulties of composition, were disliked by the Port-Royalists. For again, while the Jesuits cultivated composition at the expense of translation, the Port-Royalists argued that familiarity with the languages themselves should precede the attempt to compose in them. Consistently with this, they recognised that while Latin verse-making might be a useful and refining study for a limited number of pupils, there must also be a considerable number quite unequal to the task—in this, again, unlike the Jesuits (*q.v.*). These, again, used grammars written in Latin, while the Port-Royalists introduced grammars written in French. With the Jesuits, once more, *form* or *style* was the first, and almost the sole, consideration, whereas the Port-Royalists argued that 'the utility of things should be joined with that of words, in order to form the judgment of the young while their memory is stocked, and even to ease the memory by fixing the words to things, which always make a greater impression on the mind.' In brief, while other educators were putting words before things, the Port-Royalists were putting things before words. This is the ground on which Ste. Beuve assigns to them the same high rank among educators as he assigns to Descartes among philosophers.

The fact that Latin had ceased to be necessary as a medium of conversation, and was ceasing to be necessary as a literary instrument, enabled the Port-Royalists to carry out reforms which could not have been expected from the Jesuits, whose schools had been in full working order half a century when the *petites écoles* were founded. In the teaching of Latin itself, composition had been emphasised as the readier way to conversation. It could now be subordinated to translation just because there was no longer need for this accomplishment. Similarly, now that it was not necessary to give Latin so large a place in the school curriculum, more room could be found for Greek. And thus the greater attention given to this language is among Port-Royalist reforms. It has been said that the Port-Royalists wrote grammars in French. The importance, indeed, attached to the teaching of the mother tongue in their schools is among the most memorable of their reforms. That Frenchmen in the second half of the seventeenth century came to write true French, and not, as hitherto, a kind of Latin-French, is, according to Ste. Beuve, largely to be attributed to Port-Royalist wisdom. Other subjects found a place in the curriculum. Pascal and Arnauld, the two men whose influence far outweighed that of all others in the Port-Royalist Society, were both geometricians. Arnauld wrote a work on *Elements of Geometry*, on reading which in manuscript Pascal burnt his own essay on the same subject. Lancelot was appointed to teach mathematics (and Greek). So that we may reasonably conclude that geometry, at any rate, had its fair share of attention.

Lancelot wrote books upon the methods of learning Italian and Spanish; and Racine, the most famous of Port-Royalist pupils, knew both languages within a short time of leaving school. For promising pupils, then, the range, if we except science, may well have been as wide as that of the most advanced of modern schools; that is, it probably included the classics, taught by methods on which, according to Bréal (*Quelques Mots sur l'Instruction*, p. 183), in France at least, no improvement has been made—modern languages, mathematics, and careful instruction in the mother tongue. The

best authorities on the subject are the Port-Royalists' own books, e.g. the *Logic*, of which there is a good English edition by T. S. Baynes, the *General Grammar*, the Greek and Latin Grammars, many editions of the classics, and the books referred to in the course of this article: Ste. Beuve's *Port-Royal*, bk. iv.; Compayré's *Histoire Critique des Doctrines de l'Education en France*, bk. ii., chap. iii.; Beard's *Port-Royalists*; and Vérin's *Etude sur Lancelot*.

Japan. *See* SCHOOLS OF ANTIQUITY and UNIVERSITIES.

Jesuits (The).—The order of the Jesuits, founded by Ignatius Loyola in 1534, was formally authorised and established in 1540. It was an attempt—and a highly successful one—to check the progress of the Reformation, and to bring back the wanderers to the fold of Rome. The means employed were preaching, confession, and education. Despite of strong and often violent opposition, the order rapidly increased, and spread its schools and houses all over Europe. At the end of the seventeenth century it possessed 180 colleges, 90 seminaries, and 160 residences, its members numbering 21,000. Here we shall confine ourselves to speaking of that part of their educational work in which the Jesuits most excelled—their secondary schools. Their universities were never very brilliant successes; and though the teaching they provided was gratuitous, they never sought to make it primary or elementary. The school system of the Jesuits received its definite and permanent form under Acquaviva, the fifth General of the order, who ruled between 1581 and 1615. In 1599 the *Ratio Studiorum*, or plan of studies, was produced; and has continued, with very few additions, to be the plan down to the present day. The most important additions to the Latin, Greek, and religion of the earlier period have been a little history, some slight attention to the mother tongue, and something in the way of modern languages. Latin and religion (a catechism and scripture history) have, however, always been the most prominent subjects.

As a rule, no one but a member of the society is allowed to be a teacher in the schools; and his watchwords must be kindness, thoroughness, repetition. It was an admirable, but in those early days an almost revolutionary, innovation, that masters should be directed 'to unite the grave kindness and authority of a father with the tenderness of a mother,' and 'to become as little children amongst little children,' so that they might win the young to study with pleasure. The thoroughness was best set forth in the advice to seek to teach a few things clearly and distinctly, rather than to give indistinct and confused impressions of many things; while the value of repetition was rated so highly that one whole day was devoted to it every week; and in the second half of the year the classes generally went over again the work of the earlier half. At the head of the school stood the rector, who did not himself teach, but appointed the staff, and carefully watched the progress of the pupils. He held his office for three years. Under him were the masters, who also were somewhat frequently moved about. Outside boarding establishments were sometimes connected with the schools, in which the children of the rich and noble were received at a moderate charge. Sometimes there were day-schools, which, under certain restrictions, were open to Protestants. Otherwise, the children were 'interned' all the year round, and cut off as much as possible from their families and all other outside influences. This contempt for, and destruction of, the home life is probably the most fatal mistake of all in the Jesuit school system. Its evil effects are visible in every country where their schools have been numerous. The course of study may be broadly described as follows. It occupies six years, usually those between fourteen and twenty. The *first year* is devoted to the rudiments of Latin, viz. the forms and correct sounds of the letters, and how to read; the *second* to grammar in its first elements; the *third* to syntax. These are called the grammatical classes. The *fourth* year is given to philology and verses; and the *fifth* and *sixth* to rhetoric. These last two are called the Humanity classes. The chief object is to produce a mastery over Latin, as over a modern language. The classics are read for their style, not for their ideas; and for this reason considerable portions of them are committed to memory, so as to supply words and phrases. Greek is also studied, as a rule, in every class; but it occupies a very subordinate place. Of arithmetic, geography, history, at first we hear nothing; and only of late years has attention been paid to them at all, and

that very grudgingly. The same may be said with regard to the mother tongue. Religious instruction —that is, a catechism, and some facts of Bible history—is, of course, a distinct feature throughout.

The work has never been excessive; generally two and a half hours in the morning, and the same amount in the afternoon, with an interval of about three hours. In the summer there is generally one whole holiday a week. The masters are directed to make the lessons as pleasant as possible, consistently with their being thorough. Amusements within the school walls are plentiful. The bodily health of the pupils is carefully attended to; and on holidays excursions are made into the country. There is nothing ascetic in the regulations. The punishments, too, are always made as light as possible; only the graver offences being visited with flogging. Where flogging does not have the required effect the offender is expelled. Emulation and rivalry of every kind are employed to induce the boys to work. Sometimes individual boys are pitted against each other; sometimes one half of a class against the other; and prizes, praises, marks of distinction, &c., are profusely distributed. To manners and deportment special attention is paid. The boys are taught to speak distinctly and elegantly, to write a clear and handsome hand, to walk with an erect and easy carriage, and to conform to all those external habits which mark a well-bred gentleman. To aid them in gaining ease and assurance of manner, and readiness of address, great use is made of the acting of Latin plays.

We may add that the master in Jesuit schools is generally rather a lecturer than a teacher. He expounds sometimes a piece of a Latin or Greek author, sometimes the rules of grammar. He does not aim at developing and training his pupil's intellect. The boys are required to get up the substance of his lectures, and to learn the rules of grammar and passages from classical authors by heart. 'When the young man,' says Mr. Quick, in his excellent account of these schools, 'had acquired a thorough mastery of the Latin language for all purposes, when he was well versed in the theological and philosophical opinions of his preceptors, when he was skilful in dispute, and could make a brilliant display from the resources of a well-stored memory, he had reached the highest point to which the Jesuits sought to lead him. Originality, independence of mind, love of truth for its own sake, the power of reflecting and of forming correct judgments, were not merely neglected—they were suppressed in the Jesuits' system.' They have fallen behind in the progress of the world; and in nothing is this so marked as the text-books used. In conclusion, we may note that the great public schools of England have taken Bacon's advice, and copied freely the schools of the Jesuits; but they have progressed somewhat, and their pupils are given a chance of a freer and wider development. But practically—even in their system of monitors or prefects—they are modelled on the *Ratio Studiorum*.

Judea.—*See* SCHOOLS OF ANTIQUITY.

Judgment.—This term refers to the mental act by which we determine the relations of our ideas one to another, as when we decide that mercury is a metal, or that an ellipse is not a circle. The result of the act of judgment is a proposition which affirms or denies something. That of which we affirm or deny is called the subject, and that which is affirmed or denied the predicate. We are able to judge just in proportion to the variety and clearness of the notions gathered by way of observation and tradition, and stored up in the memory, and also to the degree of care with which we reflect on these. Children are weak in judgment, partly because they lack experience and ideas, and partly because they are not capable of that sustained effort of will which is involved in comparing objects or ideas one with another on all sides, so as to see exactly how they are related. Hence, the rashness and crudity of many early judgments. The faculty of judging requires careful training in special directions, as that of the probable in human affairs, the good and bad in art, the right and wrong in conduct. Here the object of the educator must be to help the child by careful observation and reflection gradually to build up a correct standard of truth, beauty, and goodness, by a reference to which sound decisions may at once be reached. Care should be taken further by a sufficient, and yet not excessive, assertion of authority, to restrain, without repressing, the impulse to form independent judgments. Lastly, the teacher should closely watch all the influences which tend to wrap or

bias the judgment; more particularly the effect of prejudice and antipathy. Judgment is viewed by the logician as the second stage in thought, following abstraction or conception, and preceding reasoning. The three operations are, however, very closely connected. An element of inference enters into most judgments; and it should be the object of the educator, in training the judgment, to exercise the child in connecting his decisions logically with the facts and principles on which they depend. In truth, to train the judgment is a part, and an important part, of training the reasoning faculty (*see* Reason). (On the nature of Judgment *see* Bain, *Education as Science*, p. 122; Sully, *Teacher's Handbook*, chap. xiv.)

Justice.—The nature of justice has given rise to much discussion. The idea is closely related to that of equity or fairness, and it has actually been defined as 'equality as between man and man.' It refers, too, to the recognition and satisfaction of all rights, which rights, so far as natural, are regarded as equal or alike in all cases. The idea of justice is thus ethically correlated with that of right, and of duty or obligation. The feeling of justice in its crude form is the instinctive impulse of the individual to resent injury, an impulse that forms the prominent ingredient in the instinct of self-preservation. Children are keenly sensitive to any invasion of their rights, and particularly to anything like an arbitrary withdrawal of a customary privilege, and to all appearance of partiality. This feeling, however, is largely personal. The higher moral sentiment of justice presupposes the development of the social feelings. It is the resentment of an injury, not to oneself, but to the community of which one feels oneself a member. This higher sentiment has to be gradually developed by a cultivation of sympathy and a habit of reflection. The parent and, in a more limited region, the teacher have much to do with determining the child's ideas of what is just. The customary manner of dealing out favours and rewards, as well as punishments, supplies to the young mind its first standard of justice. Hence the importance of strict impartiality, and of a clear definition of the boundaries of individual liberty and obligation in all our dealings with children. (*See* on the nature of Justice, J. S. Mill, *Utilitarianism*, chap. v.; and Prof. Sidgwick, *Methods of Ethics*, bk. iii. chap. v.; and on its educational aspects, Schmidt's *Encyclopädie*, article 'Rechtsgefühl.')

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Kant, Immanuel (1724–1804), the German philosopher who has exerted the widest and most profound influence on the thought of this century, has left his mark, among other subjects, upon that of education. When Professor of Philosophy at Königsberg he was required by an old regulation to lecture publicly on Pedagogy, or, as the subject appeared in one of Kant's courses (1776–7), 'Practical directions for educating children.' These lectures, *Ueber Pädagogik*, were published later on (1803) by F. T. Rink, one of Kant's pupils. Kant's occupation with the problem of education was not, however, wholly due to an external necessity. He felt himself drawn to the subject in more ways than one. He had had considerable experience in teaching, having been private tutor nine years before entering on his academic career as *Privatdocent*. Not only so, he was led to think of education by Montaigne (*q.v.*), who, for a time at least, was his favourite author, and still more by Rousseau (*q.v.*), whose influence on Kant's mind in the earlier stages of his philosophic activity was very powerful. The *Lectures* unmistakably betray the influence of Rousseau's *Émile*. How deeply questions of education interested him is attested by the fact that he warmly advocated the schemes of Basedow and Campe in a Königsberg journal. In order to understand Kant's views one must eke these out by references to some of his philosophical works. Thus, his ideas on the moral education of the young are sketched out in the second part of the *Critic of the Practical Reason*. In the later period of his literary activity, in which he fairly broke with the teaching of Rousseau, he seems to have given less attention to education. Still, there are evidences that he now and again reverted to the subject, as when he gives us a fragment of a moral catechism at the close of his *Metaphysik der Sitten*.

Kant's general conception of education flows from his philosophical principles, and more particularly his idea of man and his destiny. The true end of man is moral freedom, that is, freedom from all external control, and a willing self-subjection to the moral law. Intellectual development is in this view subordinated to moral. The attainment of this moral freedom is the result of self-improvement. The self-development of the individual is, however, connected with, and in a manner included in, the self-development of the race. Man, says Kant at the beginning of the *Lectures*, can only become man by education. The education by each generation of its successor is viewed by him as a necessary factor in the upward striving of the race towards perfection. Hence, he conceives of the object of the educator as the adaptation of the child, not to the world as it exists at this particular moment, but to the idea of humanity and to its destiny as a whole. In defining the scope of education, Kant touches on the question since named 'nature and nurture.' He would like to see 'the great' busy themselves with the work of teaching, so that we might know how much education can accomplish. He is also strongly in favour of freedom of education from State control, so that experimental schools may be established. This, and other remarks, clearly show how fully he recognised the difficulty of the art, and the need of illuminating it to the utmost on the side of experience, as well as on that of science. He divides education into two chief branches, physical and practical. In illustrating the first Kant, like Locke, does not disdain to enter into the homely details of children's diet. He has some good things to say about the training of the senses, and particularly the eye, by means of throwing and other games. He follows Rousseau and Basedow in emphasising the need of a hardening regimen in physical education. Practical education has for its end the development of personality. Under this head Kant makes, according to his habit, a number of distinctions of his own. It has a negative side, discipline, which consists in keeping away faults, and a positive side, instruction and guidance. This last is either scholastic, aiming at skill (*Geschicklichkeit*), pragmatic, at wisdom (*Klugheit*), or moral, at morality (*Sittlichkeit*). By the first (the work of the *Informator*) the child gets worth as individual; by the second (the work of the *Hofmeister*), worth as a citizen; and by the third, worth as a man.

Kant places moral training or moralisation in strong contrast to culture, the latter of which prepares for all sorts of ends, whereas the former prepares for good ends only. He deviates from Rousseau in his method of moral education. Though he distinguishes a lower obedience derived from compulsion, and a higher and free obedience derived from trust, and emphasises the greater importance of the latter in moral development, he insists also on the necessity of the first in the earlier years. He is strongly opposed to an indiscriminate indulgence of children's wishes, and especially to gratifying them when they make themselves burdensome to others by crying. At the same time the influence of Rousseau is seen in his observations on punishment. After obedience to law, which Kant regards as the first chief feature of moral character, the moral educator has to develop truthfulness and sociability. As may be seen from these extracts, Kant's chief contribution to education is the elevation of its end. The *Lectures* are the outcome of a strenuous effort to harmonise the claims of freedom and duty, and as such form a valuable corrective to the one-sided theory of Rousseau. With respect to intellectual education, Kant's remarks are very unsatisfactory. The bearing of intellectual on moral development is not dealt with, nor is there any adequate recognition of the disciplinary value of learning. The only approach to this point of view is when he sets the lower faculties, and more especially memory, in subordination to the higher (understanding and reason), and urges that the former should only be exercised so far as necessary for the best discharge of the latter. (*See* Dr. Willmann's edition of the *Lectures*, with introduction, &c., in Karl Richter's *Päd. Bibliothek*, Band x. Cf. article 'Kant' in Schmidt's *Encyclopädie*.)

Kindergarten. — Frederick Froebel founded the first Kindergarten at Blankenburg in 1837. The name expresses the analogy between child and plant life, to which he constantly referred. The system which he elaborated is intended for children old enough to speak and to run alone, and was the practical embodiment of the

philosophic study and experience of years, devoted to the science of education. He maintained that the mother should begin the child's training from the cradle, she being the teacher provided by Nature. In accordance with the indications of Nature, he sought to develop the child's body by wisely directed physical movements. He saw that the child's inborn desire for activity manifests itself in play, and that children love to play together. His system, therefore, guides this inclination into organised movement, and invests the 'games' (unknown to the child) with an ethical and an educational value, teaching, among other points, besides physical exercises, the habits of discipline, self-control, harmonious action, and purpose, together with some definite lesson of fact. Thus, the Kindergarten games develop the all-sided activity of a child, of its body, mind, and spirit. The same method is followed in the development of its sensibilities. The child's eye is trained, its sense of colour, of size, proportion, distance, form; the ear, its sense of sound, articulate and inarticulate, and in conjunction with its voice, as in music; the hand, the organ of touch, of manipulation, of mechanical skill; all these are brought into play, both singly and in relation to each other, and also in co-operation with the mental and moral faculties. The child's will, observation, perception, memory, thought, ingenuity, are all considered in the properly organised Kindergarten. The Kindergarten training has, however, a far wider sphere than a mere systematic organisation of the activities and sensibilities of a child as regards the child individually. It recognises Froebel's principle of the threefold relationship of the child, that is to say, to Nature, animate and inanimate, to Man, and to God. This gives to the Kindergarten a high standard of moral and religious training. The child is brought, in every good Kindergarten, into actual practical contact with Nature. The care of plants and of animals, which Froebel designed as part of his system, quickens the child's sympathies, enlarges its sphere of interest. This interest, this sympathy, will by wise direction be gradually extended, and the child will recognise the duties which it owes to its fellow-men, and begin, as it were, to enter into its social duties. It will also see, both in nature at large and among its fellow-men, the workings of the supreme power and wisdom of God the Creator, providing for and overruling His creatures, and thus its religious instincts will be guided and brought into action. If the Kindergarten is to be worked out to its full, it has need of wise and observant teachers to fulfil its designs. Its virtue depends upon the right understanding of its principles, and also upon the proper application of them. The whole system may be turned by an ignorant teacher into a mere mechanical contrivance, its teaching vitiated, its spirit misinterpreted, and its significance lost. Therefore, teachers must themselves be taught before they can hope to carry out the system in its full, though simple methods. Not only must they learn the games, the occupations, the songs, and the various methods of which each good Kindergarten has many in its *répertoire* not learnt from books, but they must study the child's nature, must understand not only its physical structure, the laws which govern its health, but, also, they must learn what they can of its inner life. For a child is a plant to be trained, not a piece of clay to be moulded by outward force, by the external will of the teacher. Its growth, like a plant's, is from the inner to the outer world. A teacher must therefore understand something of that inward development of the growth, not only of the body, but of the child's mental and moral nature, must actually be able to comprehend the reason of a child's action before that action can be properly dealt with. Not only must a teacher be able to understand children in general, but a good Kindergarten teacher should make a special study of each individual child, for, as plants vary in the treatment they require, so also do children.

For the purpose of obtaining good Kindergarten teachers, training colleges have been started in many countries, and it is principally because of the want of good teachers that the Kindergarten has not, until lately, taken a greater hold in England. Further, though a teacher may have learnt both the mechanical and the theoretical part of the system, the practical part, the actual teaching, has at first to be done under supervision, in order that practice and theory may coincide, and for this purpose training colleges have Kindergarten schools attached to them. In order to obtain a uniform system of teaching, and to avoid what may be called spurious Kindergarten teaching, the Joint Board of the

Froebel Society and the Kindergarten Association, Manchester, hold examinations and confer certificates on successful candidates. Candidates for the Elementary Certificate have to pass, among other subjects, in natural science, Kindergarten gifts and occupations; in the biographies, principles, and methods of Pestalozzi and Froebel; in class teaching, and in music and singing. For the Higher Certificate, they must also pass in geometry, in two out of four sciences, in theory, history, and practice of education and hygiene. It will thus be seen that the teachers of the Kindergarten system are required to know far more than the mere occupations and games, and it is hoped that teachers thus trained may be able to carry out the true spirit of Kindergarten teaching, and train not only the memories, brains, and mechanical and physical faculties of the children, but also their whole natures, bringing into full and healthy activity the moral and religious part of their being, so that the development of the whole may be harmonious and symmetrical. Students can be trained at the various colleges, which send up candidates to the examination of the Joint Board. The following list may give the reader some idea of the methods employed in the Kindergarten to carry out the principles already mentioned; and it is well to remember that form, geometrical and symmetrical, and numbers enter largely into these methods. *Kindergarten Occupations* may be generally described as below.

I. Six Gifts, i.e.—

Gift 1. Six coloured woollen balls—teaching colour, roundness, softness, texture, exercising the body in the game, and teaching dexterity, quickness of eye, accuracy of aim.

2. A wooden ball, roller, and undivided cube. Teaches comparison of forms, detail of forms, i.e. corners, edge, sides, qualities and motions of each form, difference of appearance when in motion.

3. Cube formed of eight small cubes, being halved across each of its faces, to teach number, simple exercises in the four rules, and an elementary idea of fractions.

4, 5, 6. Cubes still further divided, and teaching not only number, but design and symmetrical forms, and the inter-relations of numbers.

II. The further occupations are stick-laying, laths, bead-work, drawing, rings, sewing, bead-threading, paper-twisting, paper-folding, paper-cutting (in the Board Schools weaving in list and in cane are also practised), mat-plaiting, colouring, planes of wood, i.e. tablets. To these may be added singing, gymnastics, which are greatly used in the games, and also object lessons, and stories illustrated by natural objects and by blackboard drawing. At the end of the article are the names of some of the books which best illustrate both the practice and theory of Froebel's teaching. The *Kindergarten* has flourished in many countries, and though in Germany, the land of its birth, it has not been adopted, as in some other Continental States, by the Government, still, in the large cities, there are a good many schools for the poorer classes conducted by cultivated and philanthropic ladies upon the principles of Froebel. Among others may be noted the Pestalozzi and Froebel House, of which Frau Schrader is the promoter and organiser, and which combines with the Kindergarten industrial and cooking schools, and classes for Kindergarten students. In Germany private training colleges have also been started, and are exceedingly useful to students from foreign countries. The theories of Froebel have also found many expositors among his own countrymen, and the philosophical nature of his work is ably maintained in treatises and periodicals which have greatly promoted the spread and knowledge of the system. In *Italy*, where education is closely allied with the growth of a young and vigorous State, Froebel's principles have been carried out with great success and energy. The Italian Government has recognised the work done by Mrs. Salis Schwabe, and the Froebel Institute at Naples, originated and designed by her, is now under the personal direction of Madame de Portugall. The Government has granted a large building in which a remarkable organisation of a series of graded schools is based upon the Kindergarten, and includes a normal school for Kindergarten teachers. This valuable institution now forms a part of the public educational system, and, as a model school, its permanence and position are thus ensured: its name is to be associated with that of the late King Victor Emmanuel. In *Belgium*, as in Italy, Froebel's principles were adopted by the State at an early period of its existence, and the Kindergarten is part of the public educational system in

that country, and Government inspectors recognise the value and importance of the '*jardins d'enfants.*' In *France*, the Crèche, Salles d'Asile, in some degree fill the ground which would be covered by the Kindergarten. But gradually Froebel's principles are permeating the soil, and have been more widely adopted in infant education. In *Austria* and *Hungary* the Kindergarten system is looked upon with more favour than in Germany, and has been partially introduced into the elementary schools. In *Switzerland* it is also favourably regarded, and has been engrafted on to the public schools in the canton of Geneva. In *America*, Brazil and the Argentine Republic have adopted the method in some degree—but it is in the United States that the Kindergarten has found, as Froebel prophesied, its most genial soil. Since its introduction there, some fifteen years ago, it has become a popular institution. In Philadelphia, it has been incorporated with the State schools, and public schools in general throughout the States are more and more unreservedly adopting the system. Free Kindergartens are numerous throughout the States, notably in San Francisco, Cincinnati, Philadelphia, New York, and Boston. Training colleges have also multiplied very rapidly of late, and several public normal schools consider a Kindergarten class a necessary adjunct to their practice-schools. Among the names connected with the rise of the Kindergarten system in America are those of Dr. Adler and Mrs. Quincy Shaw. Miss Peabody, whose enthusiasm and generosity have given the movement powerful assistance, has identified herself with the objects of the system, and has written and lectured with great success on the subject. In *Canada*, Ontario has adopted the Kindergarten as part of the State system in many of its schools, notably in Toronto, where a Kindergarten forms part of a model school under the Education Department. In *India* the Kindergarten has been introduced into some of the schools of native children with great success, the materials for the occupations, the songs, the games, having been carefully adapted to the new soil and to the circumstances of the far East. In *Japan* the Kindergarten is a part of the school system. The history of the Kindergarten in England is as follows: In 1854, two years after Froebel's death, the Kindergarten system was introduced into England, almost simultaneously in London and Manchester, and Madame von Marenholtz Bülow published in that year a pamphlet in England on *Infants' Gardens*. In 1859 Fräulein Heerwart and Madame de Portugall were working separately at Manchester. Later Fräulein Heerwart worked at Dublin and Belfast, and Miss Praetorius and Miss Douck in London. But it was not till about 1874 that much energy was displayed. The Kindergarten Association of Manchester had been started earlier, but from that year date the Froebel Society and the Croydon Kindergarten under Madame Michaelis. In 1874 the London School Board appointed their first lecturer on the Kindergarten system to the teachers in their infant schools, Miss Bishop being the instructor. In the same year the British and Foreign School Society established a Kindergarten Training School at Stockwell. Since that year the system has made much progress throughout England. The Froebel Society, under the able presidency of Miss Shirreff, and aided by Mrs. William Grey, has established a high standard of excellence for Kindergarten teachers who take its certificate, and seeks to diffuse throughout the United Kingdom general interest in and knowledge of the system. There are Kindergartens in most of the large towns, such as Bedford, Cheltenham, Liverpool, Manchester, Inverness, &c. The British and Foreign School Society established a most admirable Kindergarten in connection with the training college at Saffron Walden. The various School Boards throughout the country recognise more or less the excellence of the system. The London School Board have continued to approve it, and have appointed a Mistress of Method, who, with her assistant, holds classes for the elementary teachers, and instructs them in the principles of the method. The system is also adopted in the Jewish Free Schools, and in the schools for the deaf and dumb. On the whole there seems to be good reason to expect the further successful application in England of the wise and simple principle of the German village schoolmaster to the problem of education among the working as well as among the richer classes. (*See* FROEBEL and PESTALOZZI.)

The following books on the Kindergarten may be consulted: Froebel's *Education of Man*. Translated by Miss Jarvis. (Lovell and Co., New York, U.S., 6*s.* 6*d.*) *The Child*

and Child-Nature. Baroness de Marenholtz-Bülow. Translated by A. M. Christie. (Sonnenschein, 3*s.*) *The Kindergarten at Home.* Miss Shirreff. (Hughes' Teachers' Library.) *Kindergarten Essays.* Miss Shirreff and others. (Sonnenschein, 3*s.*) *Education in the Home, the Kindergarten, and the Primary School.* Eliz. P. Peabody. (Sonnenschein.) *Principles of the Kindergarten.* Miss Lyschinska. (Isbister, 4*s.* 6*d.*) *The Kindergarten and Child-Culture.* Henry Barnard. (Hartford, U.S., 15*s.*) Froebel's *Mutter- und Koselieder.* Translated by Miss Lord. (W. Rice, 86 Fleet Street, 7*s.* 6*d.*) *Kindergarten Songs and Games.* Mrs. Berry and Madame Michaelis. (Myers, 1*s.* 6*d.*)

Knowledge.—By knowledge we understand the product and end of all intellectual activity. It is something more than a mere subjective state of certainty, for we may feel certain and yet not know. It has an objective reference, and implies a correct grasp of reality or truth, or, in other words, a legitimate or justified certainty. In the case of the direct apprehension of objects by the senses (immediate cognition) knowledge implies a careful method of observation, and a comparison of our observations one with another and with those of other persons. In the case of all inferred knowledge (mediate cognition) the validity of the mind's conviction depends on a due observance of the logical conditions of correct thought. It is now commonly admitted that the ultimate purpose of intellectual education is not so much to furnish the learner's mind with a definite amount of information, as to put it in the way of gaining true knowledge of any kind, and to supply it with a criterion by which it may discriminate real knowledge from doubtful opinion. And this result will be reached in the measure in which the teacher succeeds in rousing to activity the child's faculty of thought in the process of communicating information. The more clearly the pupil thinks out every new acquisition for himself, connecting it logically with that he already knows, and so recognising its inherent probability, the more skilled will he become in the detection of what is true and what is false. Knowledge has been divided into different kinds. Besides the distinction between immediate and mediate cognition already referred to, there is the contrast emphasised by Leibnitz between intuitive knowledge, such as we gain by the senses, and symbolic knowledge, as that of all vast numbers, which cannot be clearly imagined, and are only known symbolically. (On the nature of Knowledge *see* Fleming's *Vocabulary of Philosophy*, art. Knowledge; on the distinction between intuitive and symbolical knowledge, consult Jevons' *Elementary Lessons in Logic*, lesson vii.)

Knowledge-Values.—The expression knowledge- or education-values refers to the comparative worth of the various subjects of instruction. This may be determined either by the practical utility of the positive results, as by the informationalists, or by the gymnastic efficacy of the study in training the intellectual powers, as by the educationalists or disciplinarians. Commonly, both standards of value are referred to. Thus, in the modern discussion of the comparative worth of languages and science, and of ancient and modern languages (*see* CLASSICAL CULTURE and SCIENCE TEACHING), emphasis is laid now on the practical usefulness of the particular information gained, and now on the benefit accruing to the learner's mind from the discipline involved. It is not by any means obvious antecedently that the two scales of value as thus determined will coincide. At the same time, the attempt has been made, notably by Mr. H. Spencer, to show that the subjects which are best for guidance are best also for discipline. (*See* Spencer, *Education*, chap. i.; Bain, *Education as Science*, chap. v.; Payne, *Contributions to the Science of Education*, chap. iii.)

Known to the Unknown.—To know a thing is not merely to be aware or conscious of its existence, but to perceive its relations to other things, and of its parts and properties to one another. We know a demonstration of Algebra when we perceive the relations of its parts to one another and of it as a whole to other demonstrations and facts of Algebra—these relations in their most general and comprehensive form consisting of difference and agreement, or unlikeness and likeness. Knowing therefore means discriminating or detecting the differences of one impression, object, or idea from another or others; and assimilating or detecting the agreements of this same impression, object, or idea with yet another or others. It is plain that we cannot discriminate a thing from, or assimilate it with, another or others of

which we know nothing. That with which we compare and contrast it, or to which we liken it, must itself be in some measure known. In other words, Knowledge (*q.v.*) advances from the known (not necessarily *completely* known) to the unknown; and its growth depends not only upon the number of things known, but also upon the number and truth of our perceptions of their relations to one another and of the relations of their parts to one another. To know a flower we examine and distinguish its parts and properties; and further, we endeavour to learn in what it differs from and in what it resembles other flowers previously seen. If we are asked to give the value of, say, the sum of the angles of a polygon, we search amongst those facts of geometry which we already know to find one or more to which we may attach it. We find that we know the sum of the angles of a triangle, and then by dividing our polygon into triangles we arrive at the knowledge required. The fact that knowledge advances from the known to the unknown has been recognised from the earliest times. The first to make it markedly prominent when dealing with practical school-work were Ratke, Comenius, and Rousseau. The first to make it largely influence their practice were the Jansenists of Port-Royal (*q.v.*) But even at the present day there is no fundamental truth which is so widely and so persistently ignored in school-work; and in no subject more than that of language. Not only do we begin with grammar, or generalised and abstract statements concerning what is still quite unknown, but we even in the grammar itself begin with defining what we have not yet observed. The true method in language, as in all knowledge, is to begin with observation, and proceed with comparison, discrimination, and assimilation in the way already indicated.

Knox, John (*b.* 1505; *d.* 1572), the Scottish Reformer, was the prime mover in the reorganisation of the educational system in Scotland in the sixteenth century. Born in East Lothian of well-to-do parents, Knox enjoyed a liberal education at the Grammar School of Haddington, at the University of Glasgow, and at Geneva. Before 1530 he became a regent at St. Andrews University in the department of scholastic philosophy, and subsequently entered orders. His philosophical studies led him to believe that the children of the people belonged as much to the nation as to the family. Hence, he reasoned, the State ought to see that every child had the benefit of the whole educational resources of the country, if found likely to profit by them. This was the first duty a State owed to its people, for Knox's theory of political liberty was not that all men have an equal right to interfere with, to help, or hinder the affairs of the commonwealth, but that all men have an equal right to the same means of training and educating themselves, and so finding out and proving whether they are 'fit to rule in civil policie, or to live in godly reverence and subjection.' His scheme, therefore, contained in the *First Book of Discipline*, presented to the Scottish Parliament and subscribed by the Secret Council in 1560, by taking advantage of the survey of the country which was then being made by the superintendents, was to plant a school wherever they recommended a church. 'If the parish be upland,' i.e. thinly populated, 'where the people convene to doctrine but once in the week, then must either the reider or the minister there appointed take care over the children and youth of the parish, to instruct them in their first rudiments, and especially in the catechism.' In all towns and populous parishes there was to be a thoroughly good school taught by a master 'able to teach at least grammar and the Latin tongue.' Such schools were meant to be training grounds for the children of every class in the community, whether noble or commoner. The scholar was to be taught to read, write, and cipher, the catechism and Bible lessons, grammar, Latin, frequently also French and music—those branches of mental training which would really educate and enable a lad to show whether there might be 'a spirit of docilitie in him or not.' The teaching must be thorough. Each school was to be examined every quarter by 'discrete, learned, and grave men.' If the examiners found any 'apt to letteris and learnyng' at the end of their school course, they were to direct them to 'proceid to farther knowledge.' If not, they were to be taught some handicraft. Education was to be compulsory, the punishment being visitation on the parents with the censures of the Church, a social punishment deterrent enough in the days of Knox. Second-class schools were to

be established in all the principal towns, to fit boys for the university by being trained in logic and rhetoric, and also the 'tongues,' i.e. Latin and French, probably Greek, and also Hebrew. The Scottish Universities were also to be remodelled in accordance with the spirit of the Reformation. The several institutions were to be endowed out of the surplus property of the Church. The great feature of Knox's scheme was its thoroughly national and non-ecclesiastical character. Foiled by the nobles, Knox appealed to the people, and they answered his call. Within fifteen years after he had propounded his scheme there was scarcely a town or parish that had not its school and schoolmaster.

L

Laboratories. *See* Architecture of Schools.

Lacedæmonian Education.—Tradition connects this system with the semi- or wholly mythical lawgiver, Lycurgus. The training of the young at Sparta consisted almost entirely of *physical* exercises. If the new-born child was weakly it was not allowed to live; if healthy and strong it was given over to the care of its mother up to the age of seven. At that age the boys were taken from the mother once and for all, and sent to a large boarding establishment, where they were placed under a director appointed by the ephors. Here they were kept and trained at the public expense—being divided into three classes (boys of from seven to twelve, those from twelve to fifteen, and those from fifteen to eighteen)—and these again subdivided and officered by the boys. Every citizen had the authority, and was bound, to punish or reprimand any boy he found committing a wrong act. It is not to our purpose here to enter into details concerning the military and gymnastic exercises, and the hardening processes through which the children and young men had to go, with the object of making them fine human animals, and of teaching them obedience, courage, and frugality. We may mention, however, that besides gymnastics the young were taught to sing and to play on the seven-stringed cithara. This music was used partly as an accompaniment to the dance (which itself was an exercise or ceremony rather than an amusement), and partly under the idea that it would exercise and train the mind and emotions in the same way as gymnastics exercised the body. Not many of the Spartans could read or write—these accomplishments not being part of the plan—and some could not even count. On the moral side the children were often led, after the evening meal, to discuss the morality of some recent public deed, or the honesty of some noted fellow-citizen, and were flogged if they answered at random. At the age of eighteen the boys—still under the control of the State—passed into the hands of other directors. It was only at the age of thirty that a young man could leave the establishment, marry, and enter on active military service. The training of the girls differed but slightly from that of the boys, and the two sexes were often mingled in their gymnastic exercises. In both cases the idea of a *family* life, of *domestic* influence, was wholly absent. The child, the youth, the adult, all lived solely under the guardianship of the State, and for the State.

Lancaster, Joseph, educational reformer, was born in Kent Street, Southwark, 1778. His father was a Chelsea pensioner. When the boy was about fourteen years old Clarkson's essay on the slave-trade fell into his hands, and so impressed him that he resolved to go to Jamaica to teach the negroes to read the Bible. He walked all the way to Bristol, where he found a ship, but he was, after a few weeks, restored to his parents. After returning to London, Joseph became usher. His friends (who were Calvinists) destined him for the ministry, but he destroyed their hopes by turning Quaker. Before he was eighteen he began teaching on his own account 'under the hospitable roof of an affectionate' father. In a very short time the young schoolmaster 'had occasion to rent larger premises,' which in turn became too small. Aided by benevolent Quakers, he half maintained many of his pupils, and thus drew around him larger crowds of children than his skill as a teacher would alone have attracted. His school grew too large for him to manage

unaided, and yet he could not afford to employ assistance, so he hit upon the plan of setting the most advanced scholars to teach the rest. One change led to another, till in the course of four or five years the innovations embraced a complete scheme of primary instruction. This scheme was at once religious and unsectarian. Lancaster held that from a school meant for the children of all denominations the peculiar tenets of all denominations should be excluded. In 1803 he published an account of his *Improvements in Education*, and began to appeal for public subscriptions. The Duke of Bedford, Lord Somerville, and other powerful patrons responded to his appeal, and he erected a large house and schoolroom in Belvedere Place, Borough Road, on a site now fitly occupied by a Board School. The new building was opened in 1804. Next year Lancaster had an opportunity of explaining his plans to George III. At the end of the interview, the king said: 'I highly approve of your system, and it is my wish that every poor child in my dominions should be taught to read the Bible.' To aid in the realisation of so pious a wish, he promised to subscribe a hundred pounds a year, and several members of the royal family also became subscribers. Thus encouraged, Lancaster began lecturing all over the country, and his missionary journeys resulted in the establishment of many schools on his method. These schools could only be conducted by teachers familiar with his plan, and as early as 1805 he began to train the most promising of his boys as masters. Being formally apprenticed to him, they were lodged in the new house in Belvedere Place, boarded and clothed without charge, and, after a certain period of instruction, sent out to schools. Lancaster's vanity had never been weak, nor his discretion ever strong. Sunned by the patronage of the wealthy and the noble, his vanity grew apace, and his discretion died. There seemed to be no end to the number of his projects, although he had not sufficient business tact to manage any one of them successfully. The result was that by the end of 1807 he owed nearly 6,500*l.*, and he was arrested for debt. His arrest marks an epoch in the history of English popular education, for, more or less directly, we owe to it the establishment of the British and Foreign School Society (*q.v.*). William Corston and Joseph Fox, believing profoundly in the potentialities of Lancaster's system, came to his rescue. On January 22, 1808, these two, 'with a humble reliance upon the blessing of Lord God Almighty, and with a single eye to His glory, and with a view to benefit the British Empire, . . . unanimously resolved' to form themselves into a society for the purpose of advancing the education of the poor. They assumed the responsibility of Lancaster's debts and took the management of his pecuniary affairs into their own hands. During the next five years Lancaster was engaged in superintending the central institution, in improving his system, and in lecturing and writing about it, and in maintaining against the supporters of Dr. Bell his claim to the merit of discovering it. Meanwhile the society started by Corston and Fox was growing rapidly, but not so rapidly as the pretensions of the man whose improvidence and enthusiasm had been the cause of its establishment. He wished to control every department of the Society's work, and to spend on a boarding-school, which he had opened for his own benefit at Tooting, funds subscribed for promoting the education of the poor, and as he could not have his own way he severed his connection with his old friends. They had released him from all liabilities incurred by him in his public work, but by October, 1813, his private and personal debts, greatly augmented by the failure of the Tooting venture, amounted to 7,500*l.*, and he was made bankrupt. Of his movements during the next five years little is known. In 1818 he determined to begin life afresh, and sailed to Philadelphia. He was well received in the Quaker city, but rumours of creditors unsatisfied and friends estranged followed him across the Atlantic, and sent him again upon his travels. He wandered through North and South America, and we find him in Caraccas, in St. Thomas, in Santa Cruz, and in Canada, sometimes lecturing and sometimes teaching. On October 23, 1838, he was run over and killed in one of the streets of New York. The character of Lancaster requires no subtle analysis. His love of children, his enthusiasm, his indiscretion, his greed of praise but not of gold, lie on the surface. He was not a great nor altogether a good man, and the permanent value of the system which he made popular was very small; but he deserves to be

remembered because he gave a strong impetus to the education of the people, and showed how all sects and parties could unite in advancing it.

Lancelot. *See* JANSENISTS.

Languages. *See* CLASSICAL CULTURE, LATIN, GREEK, and MODERN LANGUAGES.

Latin.—The position which the Latin language occupies in education depends partly on its history, and partly on its intrinsic educative power. In the schools of the middle ages (*q.v.*) Latin was the only language taught, because it was then the only language used for literary purposes, and it contained all the information on every subject which an educated man desired to possess. This state of matters continued practically till the Reformation. But with the rise of modern nationalities and modern languages and literatures, Latin became gradually less and less the vehicle of thought. It ceased almost entirely to be employed for purely literary purposes, and was restricted to treatises which expounded philosophy, philology, and science. Within this century even this restricted use of Latin has reached almost the vanishing point, and it has become the custom for philosophers, scholars, and scientific men to convey their discoveries in their native language. There is therefore now no need to learn Latin in order to communicate thoughts or facts to others. But survivals of old practices are still to be found in the educational arrangements of various countries. Thus in many schools of Germany pupils are trained to speak Latin, and an original essay in Latin was obligatory at the final or leaving examination of the scholars; and though the obligation has been recently removed, the discussions which have followed on its removal render it not improbable that it may be replaced at some future time. In England, on the other hand, great attention has been paid to composition in Latin verse, and in the public schools an enormous amount of time has been spent on this exercise, though within the last quarter of a century strong protests have been uttered against the practice, and much less time is now given to it.

Latin, then, is no longer learned that it may be spoken or written. This change in the object of teaching the language has altered the question of its expediency. The present state of the question may be exhibited thus. A boy has to be trained in some intellectual pursuits from the age of ten or eleven to that of seventeen or eighteen. What are the pursuits that are best calculated to produce a man of vigorous intellect, of sound heart, and of practical power? Has Latin a place among these subjects, and if it has, what is this place? An adequate discussion of this matter would involve a treatise on education; but in dealing separately with Latin as a subject of instruction, it has always to be remembered that no just view can be taken of it unless it be viewed in connection with the other subjects that ought to be employed in education. The reasons which determine the place of Latin among educational subjects may be stated thus. One essential part of the education of human beings must be training in the thoughts, interests, actions, and all that concerns the welfare of men. This training can be given only through language which is the vehicle of human thought, and literature which is the expression of the best and noblest human thought. What language, then, and what literature are likely to be most successful as instruments in the training of a boy from ten or eleven to seventeen or eighteen, not apart from, but alongside of, the other subjects which he must learn? The answer of educational experience up to the present day is unquestionably that the Latin language and the Latin literature are the best for the purposes of education. Arguments have been adduced to show that other languages are better adapted for the purpose. Some have suggested English, some have suggested French or German; but as yet no experiment has been tried in schools with any of these languages which has proved a success. These languages ought to be learned, but in teaching them the teacher has not the same materials and opportunity for developing the powers as he has with Latin. Both the Latin language and the Latin literature are specially suited to a boy of from eleven to seventeen. The language is such that the connection of one word with another in a sentence is indicated by the terminations. There is thus a clear, visible sign of the connection of the words. The words themselves connote things and ideas not too familiar to the boy, and he thereby rises from a state of routine and almost unconscious knowledge to a clear consciousness of his thoughts and their bearing on reality. The boy

from eleven to eighteen is at the stage when it is his work to advance from the concrete to the power of dealing with the abstract, from the individual to generalisations more or less wide. The Latin language and the Latin literature afford him the most varied opportunities of this process, as the Romans were at that stage of mind when the tendency to the concrete was powerful, and abstraction and generalisation were only partially employed. The literature of the Romans is thus to a large extent within the comprehension of the boy of sixteen or eighteen. Roman history also presents simple characters and simple problems, and exhibits few of the complexities which cause action of the highest kind in modern times to demand great powers of abstraction and generalisation. These and various other considerations render Latin peculiarly appropriate as the dominant language for teaching purposes in the case of a capable boy who has time to spend on the complete education of his mind in all directions. Both language and literature are well adapted to his years; the lessons can be so arranged that he shall always have difficulties, but such difficulties as he can overcome. The teacher can always employ the lesson to make the boy think, and a teacher is always needed to help the boy out of the difficulties or uncertainties which lie across his path. And in the end Latin literature confers on him a knowledge of a civilisation on which our own is based.

Various methods of teaching Latin have been advocated At the earliest stage, when Latin was the language of all culture, the boy learned it in his father's house from conversation, and his training in it was carried on by means of conversations in Latin. To make him acquainted with all the forms of the language, grammars had been prepared long before the fall of the Roman Empire. These grammars were based on philosophical ideas derived from Aristotle and the Stoics, and were intended to co-ordinate all the grammatical facts of the language. When the practice of training in Latin by conversation ceased, these grammars still remained in use, and the Latin grammars of the present day are loaded with terms derived from the metaphysical ideas of the ancients. Pupils were expected to begin their course with learning these grammars, which were usually written in Latin down to a recent time, and there are still schools in which boys are drilled solely in grammatical forms and rules for a considerable period before they read an author. A reaction against this method took place, and it was urged that pupils should learn Latin as they learn their mother tongue. School books were prepared in harmony with this idea, and in order to carry it out easily the names of all objects familiar to the pupil were set down for committal to memory, and conversations including them were to be diligently studied. But objections to this method were soon strongly presented. There were few teachers that could themselves talk Latin fluently and accurately. The boy's intellectual powers were not advanced by learning the equivalents in Latin for the common material objects which he met with daily, and they were of little or no use in helping him to read the Latin authors, the comprehension of whose ideas was to form one main instrument in his culture. A kind of medium way was suggested, especially by Locke and Hamilton (*q.v.*). The language ought to be learned by induction. A Latin sentence must be placed before the pupil. The teacher must tell him the meaning of the sentence. And then the pupil is to discover what forms indicate this connection in a sentence, and what forms indicate that, and thus he learns to form a grammar for himself, and by a similar process in regard to words he forms a dictionary for himself, tracing the various meanings of the words to some original notion. Jacotot added to this that the pupil must be confined at first to one book, which he is to commit to memory. He must know every word and sentence of it at his fingers' ends, and having mastered this he will be able to find within some part of it the solution of all the difficulties which he may encounter in his further reading of books in the language.

In more recent times a further change has taken place in the teaching of Latin. It is now generally recognised, as a result of comparative philology, that inflections are the remnants of words. There is thus in an inflected language like Latin no simple word in a sentence, but every word contains at least two portions. The first is the root, the other indicates the relation of the idea of the root to the other ideas expressed in the other words of the sentence. The pupil, it is argued, should be taught to distinguish from the very first

between these two portions of the word, and he should learn as soon as possible the radical idea of the root and the original meaning of the inflection. A knowledge of the radical idea of the root is the basis of all lexical knowledge. A knowledge of the original meaning of the inflection is a knowledge of syntax, and therefore a knowledge of the inflection should not be separated from a knowledge of its meanings. Many of the more recent Latin grammars have carried out more or less successfully this mode of teaching Latin, based on comparative philology.

The great point of discussion in connection with the teaching of Latin is how we should begin to teach Latin. The subsequent stages of the process admit also of discussion, but there is no serious difference among educators, except in regard to two points mentioned already, the writing of Latin prose and the writing of Latin verse. Speaking generally, the conclusion to which most educationists have come is that Latin prose should be employed solely as a means of impressing the grammatical forms accurately and firmly on the memory, and that Latin verse should be left to those who have a taste for it.

The literature on this subject is immense, very many discussions of the subject appearing in pamphlet form. In regard to the value of Latin as a means of education, mention may be made of Herbart, Beneke, Schmidt, Newman, Schrader, a very good pamphlet by Jones, and *Essays on a Liberal Education*, edited by Farrar, and on the other side Paulsen, Hodgson, and Bain. On the teaching of Latin a lucid historical account is to be found in Raumer's *Geschichte der Pädagogik*, Dritter Theil, p. 59. Most of the books on the value of Latin also discuss methods of teaching. More modern efforts can be seen in the works of Wilhelm, Lattmann, Perthes, and Eckstein. Books on *Gymnasial Pädagogik*, such as Nägelsbach's, Roth's, Schmidt's, and Thring's, discuss the question. Dr. Donaldson, senior principal of the University of St. Andrews, has proposed a new method of teaching Latin as an embodiment of the ideas of this age in his *Elementary Latin Grammar* (Nelson, 1880). *See* also CLASSICAL CULTURE.

Latin (Pronunciation of).—The question of the pronunciation of Latin has come into great prominence since the syllabus of Latin pronunciation prepared at the request of the head masters of public schools of England appeared in 1872. The need of a change in the English pronunciation of Latin had come to be strongly felt. Each nation is inclined to follow in the pronunciation of Latin the same method which it follows in the pronunciation of its own language. Thus the Italians pronounce *ci* as *chi*, the Germans *eu* as *oi*, and the French articulate every syllable with a slight accentuation. The result of this practice in England was a wider divergence from what was acknowledged on all hands to be the pronunciation of the Romans themselves in the time of Cicero than was to be found in any other country. All other nations retained the sounds of the vowels *a*, *e*, *i*, *u* which were given to them by the Romans; the English alone pronounced *a*, *e*, *i*, *u*, as *a* in *fate*, *e* in *meet*, *i* in *pine*, and *u* in *hum*. They also uniformly sounded *c* and *g* before *e* and *i* soft, as in *city*, *gin*. These pronunciations create obstacles to a ready apprehension of many of the facts and principles of comparative philology, and some scholars resolved to make an effort to restore in English schools the exact pronunciation of vowels, consonants, and diphthongs practised in the time of Cicero. For the settlement of this question ample materials were supplied by the masterly work of Corssen, *Ueber Aussprache, Vokalismus und Betonung der lateinischen Sprache*, 2nd edition, 1863. The task was assigned to Professors Palmer and H. A. J. Munro. The principal points in their scheme are that the vowels should be pronounced as by all Continental nations, that *c* and *g* should always be pronounced hard, and that *u* or *v* should always be pronounced as *w*. Thus *viva voce* and *vicissim* are to be pronounced *wiwa woke* and *wikissim*, and *Cicero* as *Kikero*. This mode of pronunciation, though recommended by the greatest authorities, has not succeeded in gaining a permanent footing, and has been adopted only sporadically. The innovation is deemed too great. It is easy to determine broadly what was the pronunciation of Latin in Cicero's time, but there are many points that still remain unsettled, and all that can be done is an approximation. A new attempt, however, is to be made to bring the pronunciation of the Augustan age into vogue.

The Cambridge Philological Society has issued a pamphlet entitled *The Pronunciation of Latin in the Augustan Period*, which has received the general approbation of nearly all the classical professors and lecturers in Cambridge University. It is expected, therefore, that this pronunciation will be widely adopted in the lectures of that University. The pamphlet was submitted to the Oxford Philological Society and obtained its approval, and accordingly it is likely that its proposals will be carried into practice in the University of Oxford. And if the professors and lecturers of both Universities employ the suggested pronunciation, it is probable that schoolmasters will follow (*see* an article by Mr. Postgate, in *Classical Review*, April 1887). But there are difficulties in the way, and the success of the effort cannot be predicted with certainty.

Besides the pronunciation of the letters, teachers have raised the question of pronouncing according to the quantities. These quantities are ordinarily neglected, except when the Roman accentuation compels attention to them. The general law of Roman accentuation requires that if the penult is long the accent must be on it; if the penult is short the accent is on the antepenult. Thus *Rōmānos* has the accent on the penult, *nobĭles* has the accent on the antepenult. But ordinarily both these words are grossly mispronounced. *Romanos* is pronounced *Rŏmānŏs*, whereas it should be *Rōmānōs*, and *nobiles* is pronounced *nŏbĭlĕs*, whereas it should be *nōbĭlēs*. Our pronunciation is thus generally very far wrong in quantity, and it is likely that a Roman would not have understood us, even if we had spoken their language quite accurately as respects grammar and choice of words. A further proposal was made by Ritschl that not only should all syllables that are long be pronounced long, but an effort should be made to distinguish in the case of words long by position, those that are naturally long and those that owe their length to position. Thus as the *a* of *mater* is long and the *a* of *pater* is short, *a* in *matris* should be pronounced longer than the *a* in *patris*. For the same reason *ēsse*, to eat, should be pronounced longer than *ĕsse*, to be (*Opuscula*, vol. iv. p. 766). The age of Cicero is adopted as the norm for the pronunciation. There can be no doubt that alike in earlier and later times the pronunciation, both in regard to the accentuation and individual letters, differed from that which prevailed at the end of the Republic. Corssen's work is the great work on the subject of the pronunciation and accentuation of Latin. The subject has also been discussed by Munro, Ellis, Roby (in his *Grammar*), and on accentuation Henri Weil and Louis Benloew have written a treatise.

Latin Verse. *See* VERSE WRITING and PUBLIC SCHOOLS.

Law (Educational).—In this article a summary is given of the Education Law at present in force in England and Wales, Scotland, Ireland, Austria, Belgium, France, Holland, Russia, India, Italy, the State of Massachusetts (typical of the United States, where each State has its own education law), the Province of Ontario (typical of the Dominion of Canada), Saxony (typical of North Germany), the Province of South Australia (typical of the Australian Provinces), and the Canton of Zurich (typical of the Cantons of Switzerland).

England and Wales.—The development of popular education, side by side with the extension of the franchise, occupies a most prominent place in the history of England for the last fifty years. Previous to 1839 Parliament exercised no direct control over any of the educational institutions of the country. And even now, though several Acts of Parliament have been passed amending and remodelling the constitution of the various corporate bodies which provide superior and secondary education—the universities, colleges, endowed public and grammar schools—yet the Legislature has stopped short of actual interference in the educational work done under the control of these bodies. With regard to elementary education, however, it has gone a step further. In 1839 it found this branch of education entirely in the hands of private individuals or voluntary associations. Prominent among these latter were the 'British and Foreign School Society,' founded in 1808 as the result of the educational revival initiated by Joseph Lancaster, and the 'National Society for Promoting the Education of the Poor in the Principles of the Church of England,' established three years later (1811) to give aid in money and books to those

elementary schools in which the Church Catechism was taught. In that year Parliament voted 30,000*l.* for the purpose of elementary education, and formed a Committee of the Privy Council to administer and distribute the sum voted. This Committee at first restricted its grants in aid to the erection of schools which were in connection either with the National Society or the British and Foreign School Society. Some years later it extended its grants to Roman Catholic and other denominational schools. The principle upon which these grants were administered was that of supplementing local effort in the building of schools. They offered 10*s.* per head for every child to be accommodated, and required that the rest of the cost should be provided by local subscriptions. In return the Committee insisted that the Scriptures should be read daily in the schools, and that the schools should submit to inspection by its officers. In 1843 grants were made towards the erection of schoolmasters' houses and training colleges. In 1846 minutes were issued by the Committee providing for annual payments in augmentation of salaries of teachers in charge of schools which obtained certificates of merit by examination. The next step taken (in 1846) by the Committee of Council was to recognise pupil-teachers of thirteen years of age and upwards, and to make payments to them on condition of their parents consenting to an apprenticeship of four or five years. Substantial aid was also granted to the training colleges which received these pupil-teachers at the end of their apprenticeship. In spite of these encouragements it was found that very many districts were unable to take advantage of the benefits offered by the Committee of Council. By the principle adopted the Committee only helped those who were able to help themselves, and in many poor districts the schools were unable to maintain themselves in efficiency for want of adequate funds. Accordingly in 1853 Parliament increased its annual grant so as to enable a capitation grant to be earned by *rural* schools on each scholar in daily average attendance who should make a minimum of 192 attendances in the school-year. This grant was extended to *town* schools in 1856. In 1860 the minutes of the Committee of Council were digested into a code; and in 1862, after considerable discussion in the country and in Parliament, the 'Revised Code' became law. Under the Revised Code direct payments to teachers were abolished: the grant earned was to be paid directly to the managers, who were left to appoint what teachers they pleased, provided that the requirements of the Code were complied with. Grants were to be paid as heretofore upon the average attendance, and, for the first time, *upon the individual examination of the scholars.* In 1870 the sum voted by Parliament had reached 840,000*l.* The schools under inspection had accommodation for 1,878,584 scholars, and 1,693,059 scholars on the books. There were nearly 15,000 certified teachers, and 2,500 students resident in the training colleges. This takes us down to the year 1870, the close of the purely voluntary era of elementary education. In February of that year a bill was brought into the Parliament elected on the extended franchise by Mr. W. E. Forster, and, after a long and animated discussion throughout that session, became law (on August 9, 1870) under the title of 'an Act to provide Elementary Education in England and Wales.' The provisions of this Act have been further amended, supplemented, and strengthened by subsequent Acts passed in 1873, 1876, 1879, and 1880. This Act, while recognising the existing schools under Denominational Bodies, and giving facilities for their further development, placed side by side with them 'Board' Schools, managed by publicly-elected School Boards, and supported by *local rates*, school fees, and Government grants. This piece of legislation has resulted in very largely increasing the supply of schools under inspection, so that they had in 1885 accommodation for 4,998,718 scholars, and 4,412,148 scholars on the books. For the leading provisions of the Elementary Education Law as at present (1887) in force *see* articles SCHOOL BOARDS and SCHOOL-ATTENDANCE COMMITTEES and CODE.

Scotland.—For three centuries prior to the passing of the Elementary Education Act for Scotland, the system of parochial schools, which were born of the impulse given by John Knox (*q.v.*) to popular education, and were established in every parish by an ordinance of King James in 1696, sufficed for the educational wants of the Scotch people. The Act of the Scotch Parliament of that year re-

quired a parochial school to be opened in every parish under a schoolmaster, who was to be chosen on the advice of the parochial minister; and the proprietors were bound to meet and vote the sum necessary for the maintenance of the school and for the salary of the teacher, and to furnish the teacher with a suitable dwelling. But the split which took place in the Church of Scotland in 1843, and the founding of the Free Church by the side of the national Presbyterian Church, brought two rival ministers into each parish, and thus created insuperable difficulties to the harmonious working of a system which depended largely for initiative and efficient working upon *the* minister of the parish. Rival schools were established in many cases, and education in Scotland languished from lack of means and divided interests. This state of things continued down to 1872, when the feeling became general that the time had come to put an end to a system which had had its day, and that an Act on similar lines to the Act which had been passed in England in 1870 was necessary to place public education in Scotland on a proper footing. Accordingly the English Parliament passed the Education (Scotland) Act, and placed its administration under a Committee of the Privy Council for Scotland (commonly called the Scotch Education Department). This Act established a School Board in every parish, with mode of election and general powers similar to those laid down in the English Act. The School Board was to have the control of all parochial schools existing at the passing of the Act, whether they were elementary or town schools, academies, high schools, or grammar schools; and in addition had the power of erecting and maintaining new schools where the need of such was proved to the satisfaction of the Scotch Department to exist. Provisions as to liberty of conscience, compulsory school attendance, payment of fees of indigent children by the 'parochial board,' are made; regulations for the inspection of schools, payment of Government grants, the qualifications of teachers, &c., on the same principles as those laid down in the English code, which is also annually laid on the table of both Houses of Parliament by the Scotch Education Department, and becomes part of the education law for Scotland. Grants are paid on behalf of all schools under School Boards, except the 'higher class public schools' as defined by the Act. It will be noted then that, in contradistinction to England and Wales, School Boards are universal in Scotland, and further, that they have the management of schools covering a wider range than mere 'elementary education,' as the term is understood in England. In other respects the Scotch and English education laws are practically identical.

Ireland.—The system of national education is based on the principle of *combined* literary and moral, and *separate* religious, instruction to children of all persuasions. The system is administered by a board of twenty commissioners, called the *Commissioners of National Education in Ireland*, incorporated by Royal charter. Ten of these must be Protestant, and ten Roman Catholic. Appointments to vacancies are made by the Lord-Lieutenant. This Board administers the Parliamentary grant, and reports annually to the Lord-Lieutenant. The schools eligible for the grant are first, *vested schools*, i.e. schools vested either in the Commissioners or in trustees for the purpose of being maintained as National schools; and secondly, *non-vested schools*, the property of private individuals. Both these classes of schools are under the control of patrons or local managers, who must be either clergymen or persons of good position. There are also model schools, of which the Commissioners are themselves the patrons. The Commissioners award aid towards the payment of teachers, and supply of books and school requisites, and (in the case of vested schools) towards building and furnishing school-houses, and (in some cases) towards providing teachers' residences. The aid granted to non-vested schools consists of salary, results fees, gratuities, books, and school requisites, and the benefits of inspection and training. Besides the ordinary schools, vested and non-vested, there are (1) three kinds of model schools for the promotion of united education, to exhibit to the surrounding schools the most approved methods of literary and scientific instruction, and to educate young persons for the office of teachers. In these schools the Commissioners appoint and dismiss all teachers and officers, regulate the course of instruction, and exercise all the rights of patrons. There are also (2) Agricultural National schools,

to which farms or gardens are attached, and (3) a few schools in which special industrial instruction—principally in embroidery and other advanced kinds of needlework—is given. Special regulations are in force for providing that any child may be withdrawn from any religious instruction of which his parents or guardians disapprove. Only laymen can be recognised as teachers. Teachers must be persons of Christian sentiment, imbued with a spirit of obedience to the law and loyalty to their sovereign ; of good health, and must have been examined and pronounced competent by the inspectors. The Commissioners have under their exclusive control a boarding training college, entirely supported by the Government grant. The salaries of National teachers are regulated by a fixed scale, according to the class of certificate held by the teacher. In addition to their salaries teachers receive 'results fees,' according to a fixed scale for each class and each subject taught. In one particular the Commissioners exercise a power unknown to the law in England and Scotland, and that is in exercising control over the books used in the schools receiving aid. The Board has itself published some of the books and sanctions others. The use of the books specified in the Board's list, whether published or sanctioned by the Commissioners, is not compulsory, but the titles of all other books which patrons or managers of schools intend to use must be notified to the Commissioners before introduction, and must not be used if they object. Grants of books are made by the Board. A programme of instruction and examination is issued, according to which results fees are paid. The standard of attainments reached and required in each year of school life is considerably lower than for the corresponding year in England and Scotland, as might naturally be expected from the condition of the population, the absence of any law of compulsory school attendance, and the comparatively lower 'average attendance' secured.

Austria.—Public elementary schools are of two kinds, primary schools and burgher schools. The public law of Austria requires that there shall be a primary school wherever there are forty children of school age within a radius of an hour's walk, and a burgher school, or superior primary school, in each school district. The sexes are, as a rule, mixed throughout the primary and the lower classes burgher schools, but are separated in the higher classes of the latter schools. Primary education is free throughout both elementary and superior grades in most of the provinces of the Austrian empire, but in a few provinces only the elementary grade is free. Schools are classified according to the number of classes into which they are divided. A complete elementary school, comprising both a primary and burgher school, should have eight classes of about eighty scholars each, but many schools have fewer—seven, six, or even five—classes. Attendance is compulsory from seven years of age. It is the custom in many parts of Austria for a master to take charge of a class of scholars on their entrance into the school, and to carry them through all the classes of the school from the lowest to the highest. The elementary schools are supported by a local authority, which has also control over the subjects of instruction and the methods employed, but generally accepts the guidance of the State authorities. Most burgher schools have connected with them continuation schools for those who do not attend the higher grade schools, at which attendance is compulsory till the age of fifteen. Small fees are charged, but, in cases of poverty, they are remitted. The continuation schools are supported partly by the State and partly by the local authorities. Below the elementary schools the Kindergarten, or infant school, is found in very many places, and is officially recognised, though not aided by State grant. In these schools the maxims of Froebel are carried out with a thoroughness and success which has made the Austrian infant schools the models for all recent improvements in the methods of instruction of children under seven years of age. Above the elementary schools stand the secondary schools, classified, as in Saxony (*q.v.*), into Real schools, Real gymnasia, and gymnasia. Above these again are the polytechnic schools and the universities. There are also normal schools for teachers, supported by the State, of which the Pædagogium at Vienna has a very high reputation for the excellence of its training of teachers for the public elementary schools.

Belgium.—The elementary schools recognised in Belgium are either public (*i.e.* Government) schools or private (clerical)

schools. This dual system of schools is the outcome of the long and successful struggle of the clerical authorities against any control of primary education by the State. As a consequence of this the law permits any person to establish, or teach in, a school without control or inspection of any kind. The result is that illiteracy abounds to an extent unknown in any other State of Western Europe. Attendance at school is not compulsory. On the other hand, the law requires that there must be at least one *public* school in each commune. These schools are under Government inspection. About 60 per cent. of the child population is being educated in public schools. The cost of the public education is defrayed to the extent of about 50 per cent. by the State, 17 per cent. by the province, and 33 per cent. by the commune. Many of the communal (public) schools and clerical (private) schools are free, partially or entirely. Secondary school education is largely supplied by the Government in schools of two classes: (*a*) higher elementary or middle-class schools, with a fee of about 50*s*. a year; and (*b*) secondary schools or Athénées, with a fee of about 80*s*. a year. The buildings are usually erected at the cost of the town, and the expenses of maintenance over and above the school fees are defrayed by the State. The Athénée at Brussels contains about 900 pupils. There are four universities in Belgium, but no polytechnic schools. The normal school for the training of teachers at Brussels is justly celebrated. There are also Government normal schools at Liège and Ghent, the former for teachers of classics, the latter for teachers of science, in secondary schools. All the schools aided by Government are subject to Government inspection.

France.—The education of France is in the hands of the State, represented by the Minister of Public Instruction and the Préfets of departments. The Minister is assisted by a 'superior council,' which consists of members elected by various university bodies, and representatives of various other interests—the faculties, the lycées, primary education, &c.—ninety-eight in all. The members are elected for four years. They sit in general sessions twice a year, but an executive committee of fifteen sits constantly. Subject to this superior council the affairs of the schools are managed by academic councils for secondary and superior education, and for primary education departmental councils. All the schools are under the inspection of a staff of inspectors, who are directly under the control of the Minister of Public Instruction. The duties of these inspectors is limited to seeing that the law is being duly obeyed. Subject to the general laws and regulations issued by the Minister, secondary and superior schools may be conducted by persons not in the pay of the State. But the whole power as to appointment of teachers, programme of studies, inspection, &c., of primary schools, is in the hands of the State.

For the purposes of primary education there is a School Board (law of March 1881) in every commune, composed of the maire and others, and the inspector of primary schools. Attendance at school is now (since 1882) compulsory. Exemption is obtained by examination at the age of eleven. Primary instruction is gratuitous (since 1881); higher elementary, which includes technical instruction, is also gratuitous in Paris and many of the large towns. A sum equal to 4 per cent. of the four so-called 'quatres contributions directes,' viz.: (1) real property tax, (2) window tax, (3) movable property tax, (4) license fees, must be provided (by the law of January 1, 1881) by every commune for the service of primary instruction. Besides this sum, every commune (except the poorest) must devote to the service of its primary schools, before it is entitled to departmental or State aid, one-fifth of the income derived from the following local sources of revenue: (1) income from its real property, (2) its share of horse and carriage duty, (3) the dog tax, (4) the net income from the octroi, (5) income from highways, markets, and fairs. If the total amounts thus raised are insufficient for the service of the schools, the State provides the deficiency. The ordinary elementary school age in France is from the beginning of the seventh to the end of the twelfth year, and is divided into three courses. The ordinary compulsory school course comprises moral and 'civic' instruction, reading, writing, arithmetic, grammar, geography, the history of France, drawing and music, gymnastics, military exercises (boys), needlework (girls), and it is strictly carried out in

the large towns. The elements of science are also taught as object lessons. Instruction in manual work has lately been introduced into a considerable number of the primary schools of Paris. The higher elementary schools, complementary, and apprenticeship schools are entitled (since 1880) to share in the subventions made for public instruction. Corporal punishment in all French schools of every grade is forbidden, and is absolutely unknown. The salaries and allowances of the teachers are determined each year by the Minister on the proposal of the préfet, and by the advice of the departmental council. From the fact that the funds for primary education are raised by the commune, it will be seen that the power of the purse rests with it and not with the préfet and the departmental council, and consequently in the larger and more public-spirited communes the real controlling authority over primary education is the communal council. Secondary and superior education is usually subsidised by Imperial taxation. In this case the local control is very slight.

Holland.—Here, as in Belgium, the law permits any competent person to establish or teach in a school without control or inspection; the sole provision for ensuring primary instruction being that there must be at least one elementary school in every commune. Attendance is not compulsory; school-fees may be demanded, but it is calculated that about 50 per cent. of the scholars are excused fees. The State contribution to the cost of primary instruction may reach 30 per cent. of the total cost. Holland, alone of Continental nations, employs the Pupil-Teacher System in staffing its schools. Facilities for secondary education exist, but the education afforded by the majority of the secondary schools is not of the highest grade, most of the schools contenting themselves with the curriculum of the German Real Schools. There are about thirty gymnasia for a population of four millions.

India.—Education forms the subject of a special department in every province of British India, but there is no corresponding department in the Government of India. The head of each provincial department is styled Director of Public Instruction; subordinate to him are a staff of inspectors of various grades, and a staff of teachers, ranging from principals and professors of colleges to assistant masters in primary schools. Both the inspecting and teaching staff are divided into a superior and inferior list. The Education Department, as at present constituted, owes its origin to the famous Despatch of the Court of Directors of the East India Company in 1854, which has been called the charter of education in India. It recommended: (1) the constitution of a separate department of the administration for education, (2) the institution of universities at the presidency towns, (3) the establishment of institutions for training teachers of all classes of schools, (4) the maintenance of the existing Government colleges and high schools, and the increase of their number when necessary, (5) the establishment of new middle schools, (6) increased attention to vernacular schools, indigenous or other, for elementary education, (7) the introduction of a system of grants-in-aid. The attention of Government was specially directed to the importance of placing the means of acquiring useful and practical knowledge within reach of the great mass of the people. These recommendations were confirmed by a despatch of the Secretary of State in 1859. The English language is the medium of instruction in the higher branches, and the vernacular in the lower. English is taught wherever there is a demand for it, but is not substituted for the vernacular languages of the country. The system of grants-in-aid is based on the principle of perfect religious neutrality. Aid is given (so far as the requirements of each particular district as compared with other districts and the funds at the disposal of Government render it possible) to all schools imparting a good secular education, provided they are under adequate local management, and are subject to Government inspection, and provided that fees, however small, are charged in them. Grants are for specific objects, and their amount and continuance depend on the periodical reports of the Government inspectors. A comprehensive system of scholarships connects lower schools with higher, and higher schools with colleges. At no time known to history were the inhabitants of India an uneducated people. Their indigenous institutions date from an early antiquity, and may be divided into two classes: (1) the Hindu *tols* or seats of Sanskrit learning, and the Mu-

hammadan *madrasas* and *maktabs*, at each of which the instruction given was mainly religious ; and (2) the *patsalas* or hedge schools, to be found in almost every village, where reading, writing, and arithmetic were taught to the children of every class but the very lowest. The religious institutions were supported by endowments in land, and it was a point of honour that all teaching should be free. The village schoolmaster received fees, generally in kind, from the pupils. The first European impulse towards secular education came from the missionary bodies, who had established themselves in Southern India towards the end of the eighteenth century. In 1781 Warren Hastings founded and endowed the Calcutta Madrasa, with the special object of encouraging the study of Persian, then the language of courts of justice as well as of diplomacy ; and ten years later the Government founded the Sanskrit College at Benares. The next stimulus came from the Act of Parliament which renewed the charter of the East India Company in 1813. In this statute it was specially provided that 'a sum of not less than one lac of rupees (10,000*l.*) in each year shall be set apart and applied to the revival and improvement of literature, and the encouragement of the learned natives of India, and for the introduction and promotion of a knowledge of the sciences among the inhabitants of the British territories of India.' At about the same time English began to take the place of Persian as the official language (though Persian was not formally superseded until 1837), and a demand arose at the presidency towns for instruction in English instead of in the vernacular or the classical languages of the East. For many years a hot controversy was waged between the partisans of either view, known as the Anglicists and the Orientalists ; and the two were fairly balanced until Macaulay (then legal member of council) lent all his influence to the cause of English education in 1835. The question was finally settled in 1839 by a minute of the Governor-General to the following purport : although English was to be retained as the medium of the higher instruction in European literature, philosophy, and science, the existing Oriental institutions were to be kept up in full efficiency, and were to receive the same encouragement as might be given to the students at English institutions. Vernacular instruction was to be combined with English, full choice being allowed to the pupils to attend whichever they might individually prefer. The usual division of educational institutions in India is fivefold : (1) universities, (2) colleges, (3) secondary schools, (4) primary schools, (5) normal schools and places for technical instruction. The universities are purely examining bodies. Excluding the newly-founded Punjab University they are three in number, at Calcutta, Madras, and Bombay—all incorporated in 1857—their constitution being modelled upon the University of London.

Though in their origin independent of the universities, the arts colleges of India may be regarded as their teaching branches. They were founded, whether by the Government, by missionaries, or by private enterprise, to promote higher education generally ; but since the establishment of the universities in 1857 the colleges have been affiliated to them, and have been obliged to adapt their curriculum to the university examinations.

Besides the arts colleges, there are Oriental colleges, of which the principal are the Calcutta Madrasa, the Canning College at Lucknow, the Oriental College at Lahore, and the Muhammadan Anglo-Oriental College at Aligarh in the North-West Provinces. At some of these instruction is given in English ; but the main object of their existence is to promote the study of the Oriental classics according to Oriental methods. Classes in law are usually departments of the arts colleges, but Calcutta, Madras, and Bombay each possess a medical college (besides medical schools) and an engineering college. In this connection also may be mentioned the School of Arts and Design at Calcutta, the Madras School of Industrial Arts, and the Sir Jamsetji Jijibha School of Art at Bombay. Secondary schools are those intermediate between colleges and primary schools. The higher limit is fixed by the matriculation standard of the universities ; the lower limit depends upon the definition of primary instruction, which is not uniform throughout India. Secondary schools are classified into (1) High Schools, whose curriculum is framed upon the examination required for matriculation at the universities ; and (2) Middle Schools, which are

sub-divided into Middle English and Middle Vernacular. The middle schools may be regarded either as a development of the primary schools, or as an introduction of the high schools; but their actual position between the two varies greatly in the several provinces. It is impossible to institute any trustworthy comparison between the secondary schools in the several provinces, owing to differences of classification. In Bengal and Assam the pupils in primary departments of the secondary schools have been included, while in the other provinces they have been excluded. Primary schools are no less difficult to define than secondary. The lower limit, of course, is elementary instruction in reading, writing, and arithmetic; but the higher limit passes imperceptibly into secondary education, the line being drawn differently in different provinces. In 1879 an attempt was made by the Government of India to enforce greater uniformity by prescribing a standard, known as the upper primary examination, which should mark the boundary between primary and secondary instruction. This standard, however, was objected to, partly as introducing an arbitrary and not a real uniformity, and partly as identifying primary instruction with the lower stage of a course ending in, and determined by, matriculation at the universities. As a matter of fact, the provinces still retain wide divergences in their system of primary instruction. The methods of supporting primary schools in the provinces differ yet more widely than the standards of instruction. The most important distinction depends upon the amount of encouragement given to indigenous schools. In Bengal, since the reforms of Sir George Campbell in 1872, the dominant policy of the Government has been to incorporate the numerous *patsalas* or village schools into the educational system by means of moderate grants to the *gurus* or schoolmasters. In Bombay the Government has always favoured the opposite policy of founding departmental schools out of the local rate, and trusting that the indigenous schools will benefit by their example. The North-West Provinces and the Punjab have, on the whole, followed the same system. So also have the Central Provinces, though with increasing efforts to encourage the few indigenous schools that exist. Assam, on the other hand, has imitated the neighbouring example of Bengal, with this difference, that the Government in Assam has had to stimulate private schools into existence by much more liberal grants. Madras enjoys a system of its own, which it owes largely to the successful growth of missionary enterprise from an early date. Here the most prosperous schools are probably those maintained by missionary bodies, and aided by the Government. The number of departmental schools is small, but these, as well as the missionary schools, have indirectly done much to raise the standard of the indigenous schools, which are both numerous and flourishing. There remains to mention the professional and technical schools which are attached to primary or secondary schools. The great majority of these are normal schools for training masters or mistresses; but there are also a few industrial schools and special classes for engineering. The system of training teachers for primary schools varies greatly in the several provinces. A certificate does not everywhere mean the same thing. In Bombay and the Central Provinces it is awarded only to those who have passed a course of two or three years in a normal school. Elsewhere it is given to any one who has been pupil-teacher in a primary school for a comparatively short time. In Bengal, since 1875, the policy of the department has been to discontinue normal schools, and to recognise as a qualified teacher any young man who had been trained in the middle or lower vernacular schools. Female education has made considerable progress in recent years, mainly through missionary effort; but it still remains in a very backward condition, as compared even with the education of boys. The Government of India, properly so called, has no concern with education, which is entirely under provincial administration. It rests with each provincial government to allot to education as much as it pleases out of the sum assigned to it for all provincial expenditure. Local rates or cesses for education, as well as for other local purposes, have been levied in most provinces for many years; but the system of appropriating local rates to education is not uniform throughout India. In the North-West Provinces, the Punjab, and the Central Provinces, the entire proceeds of the local rate are credited to provincial

revenues, and then a portion is allotted to education. In Madras, the local rate is administered by bodies that are to some extent independent of the provincial government. In Bombay alone is a proportion of the local rate appropriated from the first to education. The extension of district and other local boards has augmented everywhere the importance of local rates in education finance. The contributions of municipalities towards education are entirely voluntary; but it may be expected that they will increase with the recent measures of municipal reform.

Italy.—The present system of public elementary education in Italy dates from the passing of a law for free and compulsory primary education in 1877. This law requires all those who are not under efficient instruction at home or in private schools to be sent to a communal elementary school from six years of age till they have completed the obligatory (lower) elementary course. This is generally passed through at nine or ten years of age. After completing the lower course scholars are expected, though not compelled, to attend continuation evening schools where such exist. The sexes are taught in separate schools. Good Kindergarten schools on the Froebel plan are to be found at Milan and elsewhere. The State authority consists of a Minister of Public Instruction, assisted by a Superior Council of twenty-one members nominated by the King. A subsidy from the State, or from the province, or both, is accorded to those communes which conform to the law and show grounds for such relief from the heavy incidence of local burdens. Secondary education is either classical, provided in gymnasia and *lycées*, or technical, provided in technical schools and institutes. Day (secondary) schools for girls have been provided in some towns, notably at Milan, but most of the girls' schools are boarding schools. There are seventeen universities in Italy, eight of which are of the first rank.

Massachusetts (State of).—The State educational authority is a Board of Education consisting of the governor and lieutenant-governor, and eight persons appointed by the governor, with the advice and consent of the State council, each holding office for eight years, one retiring each year. All vacancies are filled the same way. The board holds all grants of lands or bequests in trust for educational purposes. The board prescribes forms of registers for all schools, and can require statistics of officers of schools and others respecting the condition of the schools. It also has the general management of the State normal schools. It also arranges the holding of 'teachers' institutes,' and defrays to a certain extent the necessary expenses for procuring teachers and lectures for such institutes. The school fund of the commonwealth—arising from sales of State lands—is administered by the board; one half of the annual income arising from the fund is distributed among the towns complying with the State law for the support of public schools. Each town is required to keep its schools open for at least six months in each year under teachers of competent ability and good morals; a sufficient number of schools for the instruction of all children who may legally attend school (five to fifteen years of age) in orthography, reading, writing, English grammar, geography, arithmetic, drawing, the history of the United States, and good behaviour. Algebra, vocal music, agriculture, farming, physiology, and hygiene are required to be taught where expedient. Every town of five hundred families must also maintain a high school which must be open for ten months, and in every town of four thousand inhabitants the high school curriculum must be widened by the introduction of the Greek and French languages, astronomy, logic, moral science, and political economy. Any town of one thousand inhabitants must provide free instruction in industrial and mechanical drawing to persons over fifteen years of age in either day or evening schools. The several towns must tax themselves in support of their schools, on pain of forfeiture of twice the sum ever voted by the State from the State fund. Every town must annually elect a school committee, to have the general charge and superintendence of all the public schools of the town, one third to be elected annually, to hold office for three years. The appointment and dismissal of teachers, of the superintendents of schools, choice of books, course of studies, &c., rest with this committee. The Bible must be read daily in the public schools without note or comment. All public schools are open free, and when parents are unable to pay for books the books are supplied at the cost of the towns. Attendance at school

is compulsory between eight and fourteen years of age. Every person having control of such children is required to cause them to attend a public school for at least twenty weeks annually, on penalty for every neglect of such duty of a fine not exceeding twenty dollars; but attendance at certain private schools is accepted under conditions. Truant officers and the school committee are responsible for inquiring into all cases of violation of this law, prosecution, &c. The school committee also determines the number and qualification of the scholars to be admitted into the high school. No child under ten years of age can be employed in any manufacturing or other establishment in the State, under a penalty, exacted from parent or guardian permitting such employment, of from twenty to fifty dollars. No child under fourteen years of age can be so employed, unless during the preceding year he has attended for at least twenty weeks, under a penalty, exacted from the owner of such establishment and from the parent, of from twenty to fifty dollars. Towns may make provision for habitual truants by truant schools, and for the special education of neglected, destitute, and abandoned children.

Ontario (*Province of*).—Each province of the Dominion of Canada has exclusive jurisdiction over its own school system. The administration of the educational system of Ontario is in the hands of a Department of Education, consisting of the Executive Council, or a committee thereof appointed by the lieutenant-governor; and one of the executive council, nominated by the lieutenant-governor, holds the office of Minister of Education. The educational institutions in Ontario subject to the Education Department embrace both primary and secondary education, and are (*a*) elementary schools; (*b*) model and normal schools and teachers' institutes; (*c*) classical or country high schools; (*d*) technical schools; (*e*) schools for deaf and dumb and blind; (*f*) the University of Toronto. There are a few institutions, principally art schools, partly aided by Government; and some universities, colleges, and schools (chiefly medical) not under Government control. The province of Ontario possesses a system of municipal self-government which is uniform throughout the province. In each municipality or unit of local government, rural or urban, school trustees or school boards are elected by the ratepayers, who are liable to support the public schools in their respective localities, and are practically the owners of them. The trustees appoint the teachers, who must possess the qualifications required by the department. They arrange and pay the salaries, purchase the school site, build the school-house, and estimate the rates for collection by the township council for all funds which are required for school purposes. They are bound to provide adequate school accommodation, to employ the required number of qualified teachers, to permit the children of all residents between the ages of five and twenty-one to attend school *free of charge*. They are required to visit their schools, to see that the law is carried out, and may appoint inspectors. A sum of money is annually granted by the Legislature, and each municipality is required to raise by rate at least an equal sum. These two sums constitute the school fund of the municipality. School grants are apportioned to each school by the inspectors according to the average attendance of the scholars, and may be withheld in certain cases. A central committee of examiners is appointed by the department to examine teachers for their certificates. First- and second-class certificates are valid throughout the province, and are held during good behaviour, whilst third-class certificates are limited to a period of three years, but are renewable by examination. Every public and high school must be opened with the Lord's Prayer, and closed with the reading of the Scriptures, subject to a conscience clause. The clergy of any denomination or their authorised representatives have the right to give religious instruction to the pupils of their own church in each school-house at least once a week after afternoon school. Schools called 'separate schools' constitute an exception to the general public school system. The right to maintain a 'separate school' is chiefly conceded to the Roman Catholics, but Protestant families may combine to support a separate school if they reside in a district where the teacher of the public school of the district is a Roman Catholic. Families of coloured people may also combine to have a separate school The principle of these schools is that the Roman Catholic, Protestant, or coloured ratepayer may elect to support a separate school, and, upon giving the prescribed notice, he is exempted from the public school rates;

but as long as he subscribes to a separate school he is not allowed to vote at the election of any trustee for a public school in his district. The separate schools are subject to the visitation of the Minister of Education, the judges, members of the Legislature, the heads of the municipal bodies in their respective localities, and the inspectors of public schools, and to such inspection as the Minister of Education may direct. They are entitled to a share in the annual grant from the Legislature of the province, but not to a share in the local assessment. General courses of instruction are prescribed for all schools in the province, elementary and higher, to be followed by the teachers 'as far as the circumstances of their schools will permit.' Hygiene, drill, and calisthenics, moral instruction, and, in rural schools, agriculture, are provided for in the general directions for courses of study. The salaries of the teachers are determined by the school trustees, and are 'fixed.' Attendance at school is not compulsory.

Russia.—Elementary education has only quite recently been organised in Russia. The social conditions of that country made common action for the education of the people difficult of accomplishment, either as regards secondary or elementary education. The aristocracy, the clergy, the military and naval profession, the trading community, live entirely apart, and each class has provided its own educational establishments, not only for what special training is required after general education is completed, but also for the general education itself of the children of that class. Even members of the theatrical profession have their own schools for both the general and special instruction of their children. The schools of theology are entirely managed by the ecclesiastical authorities of the Greek Church, but the army, navy, and theatrical schools are controlled by the several Government departments. The organisation of all *public* instruction is in the hands of a Minister of Public Instruction, who has under him an advising council, with a staff of inspectors. The public elementary schools were organised in 1874, to make elementary education accessible to both sexes of the working classes throughout Russia. They are supported by the combined subsidies of the State, the *zemstvos* (or territorial popular councils), and either the communes or private bodies. Attendance is practically compulsory. Instruction is given free of charge, and in many cases even books and appliances are provided gratis. Success at an examination on leaving these schools entitles the boys to a partial reduction of the compulsory term (six years) of military service. Infant schools are also found in the more important towns, taught on Froebel's methods. The machinery for secondary education comprises gymnasia for both sexes, and Real schools. No important town in Russia is without a school of the latter kind, where the three obligatory languages are taught, viz. Russian, German, and French, besides mathematics, commercial geography, and drawing. Russia has nine universities, of which that of Moscow is the most ancient (founded 1755) and the most renowned. The education of the girls of the upper classes is provided for, and is carried on, to a much greater extent than in almost any other European country. Courses of instruction for women similar to the university courses for men have been laid down since 1872, and are taught by the professors of the university, a movement which has its parallel in England in the recent facilities for the higher education of women by means of Girton and Newnham Colleges at Cambridge, and Somerville Hall at Oxford.

Saxony. — The remarkable impulse which has made Germany, as has been said, 'a land of schools,' arose from the influence of the Protestant reformer Luther, as that of Scotland did from that of his fellow-evangelist, John Knox (*q.v.*). It was Luther who said: 'If I were not a minister of the Gospel, I should wish to be a schoolmaster.' Luther died in 1546, and the first outlines of the Saxon system of national education appeared in a law of January 1580. From these outlines the whole present system has been developed, following through the centuries the development of the social life of the people, and receiving fresh extensions as the sense of the vital importance of intellectual force, as a set-off against the physical force of the nations arrayed against them, was quickened by the defeats of the early years of the century. It was in 1805 that attendance at school was made compulsory in Saxony. Successive reorganisations of the school system have taken place in 1835, 1848, 1851, and finally in 1873.

The fundamental idea of the new law of 1873 was that the whole system of education of the country should be placed under the sole control of the State, and that the management of the schools should be taken out of the hands of the clergy, as clergy. But this action of the State did not imply that it was henceforth to be in antagonism with the Church on the subject of education. On the contrary, it is distinctly stated that the 'Volksschule (Elementary School) has for its object the religious training as one part of universal human education.' The religion taught by a particular school is the religion of the majority of the parish, but the rights of the minority are preserved. It is in the power of the minority (as in Canada) to establish a school for itself, provided it can find the means to maintain it. When the minority cannot afford to do so, the children receive their secular education in the public school, and their religious education from their own denomination. Every child is required to attend the elementary school for at least eight consecutive years, from six to fourteen. This is the case all throughout Germany, but in Saxony, as in some other states, children who have not made satisfactory progress in the elementary school at the age of fourteen are obliged to attend a Fortbildungsschule, or continuation school, held in the evenings and on Sundays, for two years longer. Parents and guardians are required to see that their children attend regularly. In general, only illness or infectious complaints are accepted as a reasonable excuse for absence. Parents render themselves liable to a fine for the non-attendance of their children at any elementary school, and both parents and employers of labour incur a similar punishment in the case of non-attendance of a scholar at a Fortbildungsschule. The school-parish (Schulgemeinde) is required to furnish the requisite funds for the erection and maintenance of the schools of the parish. Those parishes which are not in a position to meet the whole expense receive a grant from the State. The payment of a school fee is demanded of all children attending school. It is levied by the managers, who are bound to adapt it to the means of the parents. It therefore varies considerably in amount, from 3*s.* or 4*s.* a year, in town schools, to 3*l.* or 4*l.* Children whose parents are very poor have their fees paid out of the local poor-chest. There are a few free schools in Saxony, but they are foundation schools, or schools maintained by charitable societies. Throughout Germany the secondary schools consist of higher elementary schools, and secondary schools proper. There are three kinds of secondary schools: the Gymnasium or classical school; the Real Gymnasium, answering somewhat to the 'modern side' of an English public school, in which Latin is taught but not Greek, additional time being given to science and mathematics; and the Ober Real school, in which neither Latin nor Greek is taught, but greater attention is devoted to modern languages, science, and drawing. The complete course in any one of these schools occupies ten years. Pupils from the gymnasium who have obtained the leaving certificate are entitled to enter any of the faculties of the university, or the polytechnic school. The leaving certificates of the Real Gymnasium and the Ober Real schools carry with them similar though not such extensive privileges. There are also Lower Real schools receiving boys from the elementary schools at twelve, and carrying through a four-years course, in some parts of the country. The secondary as well as the elementary schools are under State supervision, and the course of instruction is practically the same in all schools of the same grade in the same State. The elementary schools are supported entirely by the parish or municipality in which they are situated. With regard to the cost of secondary schools the practice varies, but most of them are supported by the locality. In some cases the local authority erects the buildings and the State defrays, in whole or in part, the current expenses; in others, a portion of the cost is borne by the province. Some few, however, are wholly or partially supported by ancient endowments. The school fees in the secondary schools are extremely moderate, and thus secondary instruction is placed within reach of parents of limited means to an extent altogether unknown in England.

South Australia (Province of).—Previous to 1875 the control of elementary education, subject to the supreme authority of the Legislature of the province (i.e. the Governor, the Legislative Council, and the House of Assembly) was in the hands of a council of education. But by an Act of the Legislature passed in that year the functions of the council

were placed in the hands of a member of the executive council of the province, who, under the title of the 'Minister controlling Education,' was constituted a body corporate for the exercise of all the powers in educational matters placed in his hands by legislative enactment. Under this Act of 1875 (as since amended) this minister has the power (1) to decide as to the efficiency of any school not being a public school; (2) to take a census of the school population; (3) to appoint an inspector-general and inspectors of schools, whose duties are to make themselves acquainted with the general condition of all schools in their districts, by two visits at least in each year, to advise the teachers as to the best way of making improvements, to examine the scholars, and to report the results of their inspections to the minister; (4) to establish and maintain public schools; (5) to appoint teachers; (6) to define the course of instruction and character of the school books; (7) to establish scholarships open for competition among scholars at public and other schools; (8) to make regulations for the training, examination, appointment, and classification of teachers, and for fixing the salaries and fees to be paid to teachers, &c. The minister is also entrusted with the expenditure of all the sums of money appropriated by the Legislature for elementary education. No money can be appropriated in aid of building school premises unless the site has been vested in the minister. At the commencement of each year a sum of money is placed to the credit of each school vested in the minister in proportion to the average attendance. This money is placed in the hands of the board of advice, and is available for the purpose of repairing and improving the school buildings. The province is divided into districts, and boards of advice are appointed in each district by the governor of the province, to exercise general supervision over educational matters, and to report to the minister on any matters affecting the general welfare of the schools. A board of advice consists of not less than three persons, who hold office for three years. Children of not less than five years or of more than thirteen *may* attend school, but attendance is compulsory for not less than thirty-five days in each quarter upon all children between seven and thirteen years of age; and a parent who neglects to send such child to school is liable to be summoned, at the instance of the board of advice, before a justice, and on conviction to pay a sum not exceeding 5*s.* for a first offence, and 20*s.* for every succeeding offence. School fees are fixed at 6*d.* per week for children above eight years of age, and 4*d.* per week for those under that age. They are paid to the treasury. In the case of parents unable to pay these fees the board of advice has power to reduce the fee to 3*d.* per week, provided the reasons for the reduction are clearly stated to the minister, who shall have the right of veto. Children of the following classes are entitled to free education: (1) children whose parents are dead, children of widows without sufficient means, (2) children whose fathers are incapacitated, (3) children boarded out by the authorities having control of destitute or orphan children. But applications for free education must be signed by the chairman of the board of advice and forwarded to the inspector-general, and be subject to the veto of the minister. The mode of staffing the schools is similar to that adopted in England, and monitors and pupil-teachers are recognised. The head teacher of a public school must be certificated. The course of instruction, which is laid down by the minister, follows the lines of the English code, but is drawn up with a greater regard to the training of the intelligence of the children; the learning of definitions by heart is deprecated until the children have formed clear ideas of the meaning of the thing defined. The Holy Scriptures in the Authorised or Douay version may be read, but the attendance at such reading is not compulsory; and no sectarian or denominational religious teaching is allowed; the teachers must strictly confine themselves to Bible reading. Moral lessons—the outcome of the circumstances of the school and the teachers' own thoughts—to enforce the necessity of cleanliness, punctuality, industry, obedience, truthfulness, honesty, and consideration for others, must be given; but no text-book is specified. The scale of salaries of teachers is determined by the minister, and fixed salaries are paid to them by the treasury.

Zurich (Canton of).—The school system of Switzerland, of which that in force in the canton and city of Zurich is taken as an example, bears a close resemblance in

many respects to that of Germany. The elementary and higher elementary (called in Switzerland secondary) education is free, and attendance is compulsory upon all children between six and fourteen years of age. They must remain in the elementary school until the age of twelve, and then they must either attend the secondary school, or, if they enter into practical life, they must attend a supplementary school (Ergänzungsschule) for four years. This latter school is held on two half-days a week, and its chief aim is to act as a continuation school. Elementary instruction in private schools is permitted, but a very small proportion of the population (barely 3 per cent.) make use of such schools. This plan of supplementary schooling is, however, found to work unsatisfactorily, and a law is about to be passed making attendance at the ordinary elementary school compulsory up to fourteen years of age. Even now no child can be employed in a factory until the completion of the fourteenth year. The so-called secondary—really higher elementary—school has a course extending over four years, and those entering such schools and remaining in them for two years (until fourteen years of age) are exempt from further school attendance. The higher schools consist of the gymnasium and classical school, and the Industrie-Schule or trade school, which prepares for the polytechnic or for direct entrance into trade. The gymnasium is entered at twelve years of age, after an examination, and consists of six classes, corresponding to one year each, so that the pupils would obtain the leaving-certificate at eighteen or nineteen, which qualifies them to enter the university or polytechnic. The Industrie-Schule is entered at fourteen, and consists of four classes, extending over three and a half years. The first class is preparatory. From the second class onwards the school bifurcates into a technical and a commercial section, the former again dividing in the third and fourth years into a mathematical and a natural science section. The commercial section ends with the third year. The educational vote of the canton of Zurich absorbs nearly one-third of the total expenses of the canton.

Law relating to Schools and Schoolmasters.—As between parent or guardian and the school proprietor the law has long been settled that the pupil cannot be removed without giving a full quarter's notice or paying a quarter's fees, unless, of course, there has been a special agreement to the contrary. If the pupil remains even only four days of the new term, and then is obliged to return home on account of illness, the parent is bound not only to pay for the incompleted quarter, but also for the subsequent one (*Collins* v. *Price*, 5 Bing. 132). Indeed, without notice, and in the absence of special agreement, the pupil can only be removed when there is a clear case of negligence on the part of the master (*Clement* v. *May*, 7 C. & P. 678). Even in the case of a parent's bankruptcy, the bankruptcy does not bar the master's claim for the accruing quarter's charges (*Thomas* v. *Hopkins*, 6 Jur. N.S. 301). The prospectus constitutes the agreement between the parent and the master, in the absence of special agreement. The schoolmaster, however, cannot sue the parent or guardian for clothing supplied or extras taught the pupil in the absence of agreement (*Clement* v. *May*, *supra*). Again, the master will be liable in damages if he knowingly permits a pupil to indulge in dangerous games, whereby the pupil receives an accident, and *à fortiori*, he cannot sue for the medical expenses connected with the child's recovery which he may have discharged (*King* v. *Fork*, 1 Stark. 423). As to the services of tutors and governesses, in the absence of special agreement, tutors and governesses are entitled to a year's notice, the hiring being a yearly one (*Todd* v. *Kenrick*, 8 Ex. 151; *Todd* v. *Kellage*, 17 Jur. 119). As to engagements in schools, on the other hand, a quarter's notice is necessary to be given prior to one of the four usual quarter-days. Thus notice will not take place as from the time at which it is given, if given any time during the quarter, but three months after the expiration of the current quarter (*Menzies* v. *Jameson*). But immediate dismissal may take place where the teacher uses profane or seditious language before the pupils, speaks disrespectfully of his employer to his pupils, is guilty of drunkenness, or acts in disobedience to the reasonable orders of his employer. Engagements for a longer period than a year should be in writing, in accordance with the Statute of Frauds. Board schools are governed by the Elementary Education

Act 1870. The law carefully protects pupils from being cruelly treated, but teachers may chastise them in a reasonable manner for disobedience to reasonable orders. Each case of alleged cruelty must be considered on its own merits, and teachers must ever use their own discretion. This, however, may be said, that the pupil must not be hit about the head or face, there must be no wounding or discoloration of any part of the body, and no such treatment as might tend to injuriously affect the health of the child. For any such maltreatment the teacher may be liable in fine, imprisonment, or damages. In the case *Roberts* v. *Falmouth Urban Sanitary Authority*, tried in the Queen's Bench Division February 6, 1888, it was decided that a head-master of a public elementary school cannot secure compensation for loss of school fees when the school is closed by order of the authorities during an epidemic.

Learning. *See* ACQUISITION OF KNOWLEDGE.

Lesson. *See* NOTES OF LESSONS, OBJECT LESSONS, and METHOD.

Liberal Education.—This term is frequently used synonymously with collegiate or university education, but there is no good reason for thus restricting its meaning. It signifies generally an education which embraces a fair knowledge of literature, science, and art, acquired for its own sake rather than for an objective purpose. It is difficult, however, to define the term accurately. According to Lord Brougham, the liberally educated man is he who has learnt 'something of everything and everything of something,' and according to Professor Huxley, he 'who has learnt to love all beauty and his neighbour as himself.'

Libraries.—In giving a brief account of some of the largest educational and reference libraries in England of the present day, it may be interesting to trace the earliest known approaches to such institutions in ancient days; and to indicate corresponding collections of valuable manuscripts and books in the neighbouring cities of Europe. To Osymandyas of Memphis is ascribed the honour of being the earliest librarian on record, while Pisistratus first founded a library among the Greeks at Athens. Alexandria boasted of one of the most famous libraries of antiquity. Both Julius and Augustus Cæsar founded libraries at Rome; and no less than twenty-eight public libraries existed in that city prior to the inroads of the barbaric hordes. Charlemagne was the patron and founder of the public libraries in France; and Pope Nicholas V. of the priceless treasures of the Vatican library. The capitals of nearly all European countries boast of splendid public and private libraries, containing precious manuscripts and historical records: those of Gottingen, Munich, Paris, Vienna, St. Petersburg, Berlin, Bologna, and Prague, having an average of 400,000 volumes. Our own country is not far behind, having the valuable collections of ancient manuscripts and books deposited both at the British Museum and Bodleian Library at Oxford, in addition to which are the splendid possessions of the Oxford and Cambridge Universities, bestowed on the various college libraries of either city. There are also immense educational reference libraries attached to the universities of Edinburgh, Dublin, Glasgow, London, St. Andrews. There are the libraries of Lambeth, the House of Commons, Foreign Office, Guildhall, Inner Temple (founded 1540), Lincoln's Inn (1497), Patent Office, London Library, Sion College, Thames Embankment, South Kensington (which includes education, science, Dyce L., and Forster L.), the University Library, and over forty others, containing over ten thousand volumes each. The libraries attached to the various hospitals, scientific institutions of London, and other large cities, constitute an important factor in the educational statistics of the day, while many places are rapidly adopting the Free Library Act, by means of which Birmingham has already (1887) accumulated some 100,000 volumes, Birkenhead 60,000, Bristol 50,000, Dundee 35,000, Leicester 20,000, Manchester Free Public Library 150,000. The university libraries for the most part are accessible only to men students, though the books they contain are to some extent obtainable by resident women students. South Kensington libraries are open by students' tickets to eligible persons of either sex, as also the British Museum and Free Libraries. The College of Preceptors and the Teachers' Guild Library, both very small modern institutions, are especially adapted to the wants of school teachers, though they should perhaps find mention here as supplying a want long felt in the world of education. The immense re-

sources open to English, Scotch, and Irish students may be better appreciated when we consider the fact that a list of no less than 160 libraries, each containing over 10,000 volumes, is given in the *Encyclop. Brit.*, eleventh edition, and most of which contain nearly 20,000, some as many as 50,000 and 90,000 volumes. A further list is given of 170 other libraries, containing under 10,000 volumes in each case.

In Great Britain any attempt that has been made at the formation of elementary and secondary school libraries has been due chiefly to purely voluntary effort, no assistance being given by the State. In many of the States of North America, as well as in some other countries, legislative provision has been made for supplying schools and school districts with libraries. The first grant that was made for that purpose in America was in 1827. The value of such libraries depends wholly upon adventitious circumstances; but to be of real use they should be composed of instructive books and those interesting to children. They should be informative, and should be such as would incite in the pupil a taste for reading. They will thus train the pupil's mind from a love of the 'penny dreadful,' and assist the mental and moral training. Teachers can greatly help in popularising school libraries by illustrating the subject of instruction with reference to some work in the library.

Licence (Teacher's).—Such a licence is a legal qualification to give instruction. It is conferred after examination, and attested by a diploma or certificate. The holder becomes a certificated teacher. The object of the licence is to 'protect the interests of the community against the evils arising from the employment of incompetent persons by those who might not be able to test the qualifications of applicants, or who might, from favouritism or corrupt motives, be willing to employ as teachers persons not possessing the requisite qualifications.' The Elementary Education Act, 1870, provides for England that 'before any grant is made to a school the Education Department must be satisfied that the principal teacher is certificated;' and that teachers, in order to obtain certificates, must 'be examined and must undergo probation by actual service in school.' The Act further provides that 'after successfully passing their examinations they must as teachers continuously engage in the same schools, obtain two favourable reports from an inspector within an interval of one year between them, and if the first of these reports be not preceded by service of three months (at the least) since the examination, a third report must be made at an interval of one year after the second report, and, if favourable, a certificate is issued.' 'Teachers under probation satisfy the conditions which require that schools be kept by certificated teachers.' The Scottish Education Act, 1872, provides that 'no person shall be appointed to the office of principal teacher who is not the holder of a certificate of competency,' which is obtained after examination. Two years' attendance at any one of the normal schools is a condition precedent to such examination. The Scottish universities confer the degree of Literate in Arts (L.A.), a teacher's degree, on those who have been students in the faculty of arts for two sessions, and have attended five classes in that faculty, so as to include four at least of the seven subjects for graduation in arts. The University of Edinburgh grants a schoolmaster's diploma to graduates in arts on passing examination in education and kindred subjects, and the University of London grants certificates to those who, being graduates of that university, have passed the examination in the art, theory, and history of education. The College of Preceptors also grants diplomas, for which principals and teachers of private schools are eligible, and the joint examination board of the Froebel Society and the Kindergarten Association of Manchester grant certificates after examination to students and teachers of the Kindergarten system.

Lichtenberg, Georg Christoph (*b.* 1742, *d.* 1799), a German man of letters, was the eighteenth child by the same marriage of the pastor of Ober-Ramstadt, near Darmstadt. From an early age Lichtenberg had been interested in the system of education prevailing in German schools and colleges. He had witnessed some changes introduced on account of the writings of Rousseau and his French followers, and of Basedow of Hamburg. Of some of these he approved, but to the greater part he applied the unsparing ridicule with which he always assailed the pedantic affectations of originality and the senseless love of change. Al-

though fully aware of the advantages of a regular education, he never forgot that the substantial improvement of the character depends upon artificial instruction to a very small extent. The most careful education, he perceived, cannot create a single new faculty; and in a civilised age no neglect can prevent the development of the faculties that exist; their growth may be retarded by unfavourable circumstances, but their vigour may be more radically injured by excessive cultivation. Education should not be mechanical or coercive, and discipline should not be bookish. His dictum was that 'the object of all education is to form virtuous, intelligent, and strong-minded men.'

Lighting of Schoolrooms. *See* ARCHITECTURE OF SCHOOLS.

Ling, Peter Henrik (*b.* 1766, *d.* 1839), the Swedish gymnast, a native of Smäland, and graduate of Upsala University, was, on account of his weakened constitution, led to direct his attention to fencing and gymnastics as a means of cure for rheumatism and partial paralysis, with which he was attacked in his right arm; and his success was the first incentive to the exertions he afterwards made to establish a treatment of diseases by these means. He was at the University of Lund in 1805, where he lectured on Norse mythology, taught modern languages and fencing, while he at the same time wrote poetry of no common merit. As he saw that the body and soul of men reacted upon each other, he aimed at 'the perfection of the organism by means of the combined and harmonious action of these two principles, restoring by his system the equilibrium which indolence, disease, or a too exclusive cultivation of the intellectual faculties may have disturbed.' Thus his system led him to inquire into the laws of therapeutics, and by studying the motory action of the body he was led to devise a system of movements, varied both in their character and in the degree of strength. He contended that the mechanical agency of the body, equally with the chemical and mental actions of certain organs, should be considered in the treatment of disease, and he believed that to the neglect of this side of the question many of the ailments of the body were to be attributed. He was an ardent advocate of his system, and his *Theory and Principles of Gymnastics* (Stockholm, 1840) is considered a work of power.

Literæ Humaniores. See SCHOOLS.

Literature. See ENGLISH.

Literature for Children.—It is necessary to distinguish between books *about* children and books *for* children. The former are numerous, the latter comparatively few. Not many writers of children's books have the art of looking at the world with a child's eyes, feeling with a child's heart, speaking with a child's ideas and a child's words. More often than not, situations, experiences, ideas, feelings, are introduced quite out of keeping with the little actors in the story, and quite beyond the mental reach and sympathy of young readers. False and unreal views of life are given, and what is in its essence wrong is unwittingly rendered amusing and attractive. A thorough scapegrace is made a charming hero; and the tales are strongly sensational, or full of morbid sentimentality or mere goodiness. The reverse of all this is what is wanted. Literature for children may be divided into *fairy tales, fables, and tales with a moral purpose, domestic tales, tales of adventure, tales of science and useful information, historical tales, travels, and biographies. Fairy tales* are the poetry of the early world, and of childhood. They are admirable in their imaginativeness, simplicity, and manner of talking. But they require caution, for they are apt to be full of old prejudices, and to introduce matters not proper for children. All elder brothers and sisters, and all stepmothers are not selfish and wicked; *Jack* takes too keen a delight in slaughtering, and *Puss in Boots* lies, and makes others lie, with too charming an ease. But many are wholly unobjectionable, and all are delightful; while the exercise they afford to the imagination is of great value. *Fables* are frequently amusing if told with real humour as are some of Æsop's; and if the moral be not too prominent, and the characters fairly in keeping with those of the animals, &c., which are introduced. *Tales with a moral purpose* are usually dull and heavy. Hans Andersen's, however, are delightful exceptions; and some of Miss Edgeworth's can still be read with pleasure by children. *Domestic tales* for the young are apt to be morbid and sentimental; nevertheless, many good examples exist in English. Of these the best of the more recent examples are by Mrs. Ewing and Mrs. Molesworth.

Both of these writers, however, have a strong tendency to write *about*, rather than *for*, children. *Tales of adventure* are proverbially delightful to children, who love *action* above all things; but indulgence in them is dangerous. Many are of the 'nightmare' class; nearly all abound with unjustifiable and even wicked doings hidden in a glare of romance; and all are liable to be too exciting, and to render the simple doings and duties of every-day life stale and distasteful. Taken in moderation, however, the best of them compensate for the harm they do by the widening of interests, the manliness (not to be confused with mere fierceness and recklessness) and the fidelity which they tend to produce. *Tales of science and useful information* may often serve to create and to feed a very valuable curiosity. *Historical tales*, when not wholly of blood and murder, will do this for the special department of history. The best are too well known to need mention. *Travels* and *biographies*, when the subjects are well chosen and worthy of attention, and when they are well told, have long charmed and will never cease to charm both young and old; and it is difficult to imagine a better way of gaining a general knowledge of the earth and of man's doings on it than by reading the numberless fine examples of both which we possess in English.

Literator. *See* ROMAN EDUCATION.

Literature of Pedagogy. *See* BIBLIOGRAPHY OF PEDAGOGY (appendix).

'Little Go.' *See* PREVIOUS EXAMINATION.

Local Examinations were instituted by the University of Cambridge in 1858. For seven years the examinations were open to boys only, but in 1865 a Grace of the Senate, at the request of Mrs. Grey, Miss Shirreff, and others (*see* EDUCATION OF GIRLS), admitted girls also. In 1867 girls were put permanently on the same footing as boys at the examinations, except that the names of the successful candidates were not given in the class lists in the case of girls unless they desired it. Local examinations were subsequently adopted by Oxford, and are now held also in connection with the Scottish universities, and Dublin and Durham. The examinations are conducted at various places throughout the country, by means of printed papers set by a central body of examiners, and worked by the candidates in presence of examiners sent down by the respective universities. Candidates for the Cambridge or Oxford local examinations are either juniors or seniors. The former are under sixteen, and the latter under eighteen years of age. Every candidate pays to the Syndicate (*q.v.*) a fee of 1*l.* The local expenses of providing an examination-room, stationery, &c., are borne by the local committee of management at each centre of examination, and to meet these expenses an additional local fee, which is usually from 5*s.* to 10*s.*, is charged to each candidate. Full details as to the conditions and subjects of examination will be found in the calendars of the universities in connection with which the examinations are held. (*See* also SYNDICATE and OXFORD AND CAMBRIDGE SCHOOLS EXAMINATION BOARD.) Examinations of a kindred character are also held by the Society of Arts, Trinity College, London, and the College of Preceptors (*q.v.*). Certificates of having passed these examinations exempt candidates from certain preliminary examinations of the universities and other public bodies.

Locke, John (1632–1704), the author of the *Essay on the Human Understanding*, and the founder of the English school of psychology, claims attention also as the writer of a short treatise on education. This work, entitled *Some Thoughts concerning Education* (pub. 1693), grew out of notes of letters which Locke, during his first stay in Holland, had written to his friend Edward Clarke, on the best way of bringing up his children. Locke had the rare advantage of speaking on education from the double platform of psychological theory and personal experience. As the first great English psychologist who systematically attempted to analyse mind into its elements, and who, rejecting the hypothesis of innate ideas as unnecessary, traced all intellectual products to experience (sensation and reflection), Locke naturally attached a new importance to education. To him the infant mind is a blank sheet (*tabula rasa*) on which experience has to write, and he is consequently disposed to ascribe the manifold differences of intelligence and character that we see among men much more to diversities of circumstances and education than to any original differences of aptitude and disposition. He may, as Hallam maintains, greatly exaggerate the effect of external influences;

and, read in the light of the new evolution psychology, which accentuates the fact of individual variation and the part played by heredity, Locke's account of the process of mental growth seems almost naïve in its simplicity. At the same time his psychological standpoint compelled him to trace out in a much more careful and thorough way than is usually done the many less obvious effects of circumstances, example, and habits of life on the growing mind. While Locke was thus particularly well qualified to deal with education from the theoretic side, his own experience, both as pupil and teacher, supplied him with ample material for attacking its practical problems. Like other independent youths, he was wearied and disgusted by the barren pedantries of the scholastic system under which he was brought up (at Westminster and Oxford), and was first stimulated by these experiences to reflect on the right methods of education. To this there succeeded a fair amount of experience as tutor, of which that in the Shaftesbury house was the most important. This personal contact with the work of teaching, combined with the decidedly practical bent of mind which makes Locke so typical an English thinker, accounts for the thoroughly practical character of the *Thoughts*. The influence of previous writers on education seems to have been very slight, that of Montaigne being the only one which is distinctly traceable in the *Thoughts*. The little treatise is faulty enough in point of arrangement and style, a fact to be accounted for by the manner of its production. As its title suggests, it consists rather of stray reflections than of a carefully reasoned theory. At the same time, it deserves the place it now firmly holds among educational classics. It must be remembered that Locke is avowedly dealing with the circumscribed, if highly complex, educational problem of fashioning a gentleman. Hence it is home-training by a tutor, such as Locke had himself carried out in Lord Shaftesbury's family, that is exclusively discussed. Physical education, including the furtherance of health and bodily vigour as well as the acquisition of physical accomplishments, naturally receives a large share of attention, the more so as Locke had not only studied medicine, but held the double post of physician and tutor in the Shaftesbury home. Next to bodily health come as essential requirements of the gentleman, virtue, wisdom, breeding, and learning. With respect to intellectual education Locke has been accused of carrying his utilitarianism too far, by insisting on estimating knowledge only by its bearing on the work of life. But this is to do scant justice to his teaching. No writer is more profoundly impressed with the value of intellectual training itself. This may be seen by the emphasis he lays on the general or varied culture of the faculties, both in the *Thoughts* and in the short essay *Conduct of the Understanding*, which should be read with the first. In truth, as a recent editor of Locke puts it, he understood by education 'rather the training and disciplining of the mind into good habits, than the mere tradition of knowledge.' With respect to moral education, Locke aimed at the production of a dispassionate being in whom reason is supreme. Locke's ideal of physical and of moral training may alike be criticised as erring by excess of severity. His recommendations for hardening the bodies of children, as well as his counsels against indulging children's wishes, were actually objected to by his friend Molyneux; yet it is curious to note that the greatest of German thinkers, Immanuel Kant, follows Locke pretty closely in both these particulars. The central principle of the *Thoughts* is that the end of the educator is to settle in the pupil, by steady unremitting *practice*, intellectual and moral *habits*; and, though the reader may now and again be disposed to resent the repetition of the dictum, he can hardly complain that its importance has been exaggerated. Although adopting private tuition as preferable to school, because of its more complete supervision, Locke fully recognised the influence of companions on the mind and character of the young; and he seeks to evade the difficulty of solitary education by exacting the maximum in the way of attention from the father and the tutor. The value of Locke's *Thoughts* resides partly in the force with which he illustrates the fundamental principle of his theory already indicated, and partly in the good sense and impartiality with which he handles all questions of detail. His remarks on the way to deal with children's weaknesses, on their timidity, on praise and blame, on punishment, on satisfying curiosity, and many other pressing problems of every-day education, will always be worth a careful perusal

by all who have to guide and control children, whether in the home or in the school. (See *Some Thoughts concerning Education*, with introduction and notes by the Rev. R. H. Quick, M.A.; also, *Conduct of the Understanding*, edited by Prof. T. Fowler. The German reader may consult Dr. Schuster's introduction to the translation of the *Thoughts* in Karl Richter's *Pädagogische Bibliothek*.)

Log-Book.—The log-book is a diary or journal, the keeping of which is compulsory in all public elementary schools. It must be stoutly bound, and contain not less than 300 ruled pages. It is kept by the head teacher, who is required to record in it such events as the introduction of new books, apparatus, or courses of instruction, the visits of the inspector or of managers, absence or failure of duty on the part of any member of the staff, or any incident or circumstance to which it may be useful or interesting to refer at some future time. Entries must be confined to matters of fact; 'reflections or opinions of a general character' are expressly forbidden. All reports made by the inspector, whether after a 'surprise visit' or after the annual inspection, must be copied 'verbatim,' and signed by the correspondent of the managers. When the annual report has been received the school staff must also be entered, and all changes afterwards occurring in it must be recorded.

Logic.—Logic is commonly defined as the science of reasoning, or of the 'laws of thought' which underlie reasoning. As employed about the reasoning process it is connected with, and indeed based on, Psychology (which *see*). It differs from psychology in that it seeks to determine the necessary conditions of *sound* or *correct* reasoning. Logic, in short, is not only the science but the art of reasoning. It is now commonly divided into two parts, (1) deductive or formal, and (2) inductive or material logic. Formal logic is concerned with the formal correctness of our thinking processes, and its rules guide us in seeing clearly all that is necessarily implied in our propositions. It deals successively with terms, propositions, and syllogisms, that is to say, the verbal forms in which the three growingly complex products of thought, concepts, judgments, and reasonings embody themselves. The formulation of the true principles of inductive research is an exceedingly difficult matter; and, in spite of the recent contributions of J. S. Mill, Stanley Jevons, and others, it is far from being finally settled. Hence the study of inductive logic ought to follow that of deductive. Very different opinions have been held as to the practical value of logic, but it is agreed by most writers that the study of the science, by supplying us with a simple method of analysing and testing our reasoning processes, enables us to carry these out with greater certainty and ease. To the teacher the study of deductive logic, connecting itself so closely as it does with the science of Grammar (*q.v.*), may be said to be of the highest value. Familiarity with the logical distinctions among terms, propositions, and arguments will serve not only to clear up his own thoughts, but to guide him in presenting facts and truths in the clearest way to the learner's mind. This applies with particular force to certain portions, such as the doctrine of logical division and definition, and of the obversion and conversion of propositions (immediate inferences). The doctrine of method, or the scientific arrangement of thoughts, which has been proposed by some writers as an additional division of the subject, has a very close bearing on the teacher's work (*see* METHOD). The study of the principles of inductive logic, by rendering the mind familiar with the methods of scientific investigation and the grounds of scientific certainty, will be found very useful to all who have to teach science. It is worth considering whether certain portions of logic might not with advantage be introduced at the end of the school curriculum. (For an account of the nature and scope of logic *see* Jevons, *El. Lessons*, i.; Bain, *Deduct. Logic*, Introd., p. 30, and following; *Encyclopædia Britann.* (9th ed.), article 'Logic.')

London University. *See* UNIVERSITIES and PROVINCIAL COLLEGES.

Long Sight. *See* EYESIGHT.

Long Vacation.—At both Oxford and Cambridge the majority of the men are down before the end of June, and do not come up again until the second week in October. The interval is the 'long vacation.' At Oxford the men who keep Trinity term remain up until the Saturday after the first Tuesday in July. At Cambridge, men reading for a tripos may

obtain permission to be in residence during July and August. It is not counted as a term, but it is a most valuable opportunity for coaching free from the distractions of term time.

Look-and-Say Method.—This is a method of teaching reading without spelling; children being taught to recognise at sight, and to pronounce, words as wholes. A child is given a general impression of the look of a word, and then this 'visual impress' is made vivid by analysis and lasting by repetition. An easy sentence is written on the black board or exhibited on a tablet. The teacher points to the words and pronounces them one after the other, the children several times repeating the sounds simultaneously after the teacher. Then the teacher points to the words and requires the children to pronounce them without help—forwards, backwards, and taken anyhow. Then single children are called on to pronounce the words pointed to in any order. Then comes the analysis. The teacher asks the children the number of letters in each word; tells them the names and sounds of each letter; calls on them to pick out the same letters on an alphabet card; and sets them to print the words on their slates. The eye, like the ear, more readily takes in things as wholes, remembers a word as a whole, and associates its meaning with its form—just as the ear associates its meaning with its sound. The method has, therefore, much to be said in its favour. No one can really be said to read until he takes in words at a glance. This method teaches him to do so from the very first. It likewise helps him considerably to learn how to spell English words—for in this the memory of the eye, the 'look' of the word, is generally our chief practical aid. Unless care be taken, however, the pronunciation—which depends on the distinct articulation of every separate sound—is very likely to suffer.

Luther, Martin (*b.* Eisleben 1483; *d.* 1546), was the son of a miner and metal worker. His parents gave him a good education. At the age of fourteen they sent him to study Latin at Magdeburg and at Eisenach. His father designed him for law, but his piety led him to join the order of St. Augustine. We have not here to deal with his long search after truth in the Bible, his fearless quarrel with the popish authorities, and his work as a religious reformer, but merely with his views as a practical educationist. 'If I were not a minister of the Gospel,' he said, 'I should like to be a schoolmaster.' He boldly proclaimed the necessity of education for all, and exposed the absurd methods of 'darkening knowledge' in vogue in schools previous to the Reformation. In 1520 he came out boldly on the question in his *Letter to the German Aristocracy*, and in 1524, in his *Letter to the Governing Bodies of all the Towns of Germany*. In the former he demanded the reorganisation of the universities and schools, whilst in the latter he urged that it was the duty of the authorities to ameliorate the condition, intellectual and moral, of the people. In 1525 he even organised a school at his native Eisleben. Amazed at the ignorance of the people, he drew up in 1529 his Great and Small Catechisms, and introduced them into the schools for religious instruction. In 1530 he published a sermon *On the Necessity of sending Children to School*. These were followed by various other separate works, besides the numerous passages which abound in his writings in favour of sound education. Whilst he maintained that parents ought to educate their children, he openly avowed that, where they failed to do so, it was the duty of the magistrates to interfere, and take the matter into their own hands. He advocated that boys and girls should not be taught more than two hours a day, as the former ought to have time to learn a trade, and the latter to learn domestic duties. In his instructions to inspectors he gave a detailed account of the work to be done, and the authors to be read, &c. The list is full of sound sense and sound religion. *See* LAW (EDUCATIONAL), sect. *Saxony*, and REFORMATION.

Lyceum (Gr. λύκειος = the wolf-slayer).—This term has assumed various meanings in different ages and countries. Among the Greeks it signified the gymnasium with covered walks in the eastern suburb of Athens, where Aristotle taught, so named from the neighbouring temple of Apollo *Lyceus*. Among the Romans it signified an educational establishment, such, for instance, as that in the Tusculanum of Cicero, or in the villa of Adrian at Tibur. Nowadays it generally denotes a second-class training school, a school or literary seminary between a common school and a college. In France it is the highest

class of secondary school, containing eight classes, while in Italy it fills the place of the higher classes of the German gymnasium. In English-speaking communities the term is applied to an association for literary improvement by means of lectures on science and literature.

Lydda (School of). *See* SCHOOLS OF ANTIQUITY, sec. *Judea.*

M

Madras System. *See* MONITORIAL SYSTEM.

Maintenon, Marquise de (*b.* 1635; *d.* 1719).—The family name of this remarkable woman was Françoise d'Aubigné. She was the granddaughter of a distinguished French Protestant writer, Théodore A. d'Aubigné, and was born in a prison, where her father was incarcerated for his heretical opinions. After her father's death Françoise was converted to the Catholic faith, and at sixteen married the poet Scarron. On his death in 1669 she was reduced to poverty, and ultimately became governess to the two sons of Louis XIV. by Madame de Montespan. The devotion with which she discharged the duties of this position made the king her friend for life. He gave her a hundred thousand livres, with which she purchased the Maintenon estate, and created her a Marchioness. Her influence over the king gradually increased, and in 1685 she was privately married to the Grand Monarque. Her ascendency, which remained undiminished down to the king's death in 1715, she employed, among other purposes, to found at St. Cyr an important school for poor girls, which she supported and superintended with the greatest devotion from 1686 down to her death there in 1719. Her letters, edited by Lavallée, are among the most charming in the French language, and show the deep interest she took in her educational work. See (1) her *Lettres sur l'éducation des filles*; (2) *Entretiens sur l'éducation des filles*; (3) *Conseils aux demoiselles*; (4) *Mémoires des Dames de St. Cyr*, &c.

Management. *See* SCHOOL MANAGEMENT.

Managers.—Every voluntary school is under the direction of a body of managers, whose duty it is to make all necessary arrangements for its efficient working. School Boards are the managers of all schools provided by them, but they may delegate the charge of any particular school to managers appointed by them. Every body of managers must consist of at least three persons, and if the school be not provided by a Board, a form signed by three managers must be sent to the Education Department, authorising one of the three to sign the receipts for grants. Managers are also required to appoint a correspondent with the Department. Managers are held responsible for the conduct of their schools, for their maintenance in efficiency, for the care of the health of individual scholars who may need to be withheld from examination or relieved from some part of the school work throughout the year, and for the provision of all needful furniture, books, and apparatus.

Mann, Horace (1796–1859), a native of Massachusetts, was the most eminent and successful promoter of popular education in the United States during the nineteenth century. After acting as classical teacher at Providence, he, in 1821, took up the study of law, and for a few years pursued the profession of advocate. In 1827 he was elected a member of the Legislative Assembly, and six years later of the senate of Massachusetts, becoming president of the latter body in 1836. His earliest public labours were in the cause of religious liberty, the suppression of lotteries, the promotion of temperance, and in favour of the introduction of railways. As a lawyer, statesman, and philanthropist, he had achieved a great reputation among his fellow countrymen, and was already selected for the important work of codifying the statutes of his native State, when, in 1837, he abandoned all his other public and professional pursuits in order to accept the ill-remunerated post of secretary of the newly established Bureau of Education, and to devote himself thenceforward exclusively to the promotion of popular education. In this office, which he filled for twelve years with untiring energy, working as a rule sixteen hours a day, he rendered to the cause of education

services for which Americans will never cease to be grateful. In the performance of his task of spreading elementary education and improving the methods of teaching, Mann had recourse to three agencies: (1) he instituted a series of periodical conferences of teachers; (2) he published a monthly periodical, *The Common School Journal*; and (3) he wrote Annual Reports to his committee of the progress made from year to year in the work of education. Of the nature of the subjects discussed in the periodical conferences, a volume which he published in 1840 presents a sample. The subjects of the seven conferences therein reported are: 1. 'Means and Object of Popular Schools.' 2. 'The Professional Preparation of Teachers.' 3. 'The Necessity of Education in a Republic.' 4. 'What God does, and what He leaves us to do in Education.' 5. 'Historical Survey of Education; its Dignity and its Degradation.' 6. 'District School Libraries.' 7. 'School Punishments.' On the third of the preceding subjects Mann delivered a stirring speech, in which he contended, with convincing eloquence, that the safety of society under a republic (and therefore under any form of government where the suffrage is practically universal) depends on the moral and mental education of the masses. In his *Common School Journal*, which he edited for ten years, he dealt with the school topics of the day, and urged his ideas in detail on teachers. His twelve Annual Reports to the Board of Education are a collection of real historical value. In 1843 Mann paid a visit to Europe for the purpose of making himself personally familiar with the condition of elementary education in the most advanced countries in this quarter of the globe. The results of this journey he embodied in his seventh Annual Report, which attracted unusual attention, not only in America, but also in England and other parts of the world. The subjects dealt with by Mann in his Annual Reports embraced school architecture, school libraries, the synthetic method of teaching reading, school hygiene, school singing, the uniformity of school text-books, the ordinary faults of scholars, and school punishments, &c. The professional training of teachers and the question of the admission of women as teachers in boys' schools also largely engaged Mann's attention. He was, in fact, the real founder of the first Normal School in America—that which was opened at Lexington in 1839, and to which females were admitted. In the maintenance of discipline in schools, and in the formation of the personal characters of the scholars, Mann attached very great value to the influence of religion, in the sense of the spirit of unsectarian Christianity, and to this end he advocates the reading of the Bible in schools. On the death of John Quincy Adams in 1848, Horace Mann was elected by a large majority to represent Massachusetts in the senate of the United States, whereupon he resigned his position as secretary of the Massachusetts Educational Bureau. At Washington he advocated the creation of a National Educational Office for the whole of the United States, similar to the institution which he had conducted with such salutary results in his native State; but he was not destined to see the realisation of this idea, which was not carried out until the year 1867. Towards the end of his life he accepted the rectorship of the unfortunate Antioch College in Ohio, where he died in 1859. His widow wrote a life of Mann, and edited his correspondence. In 1865 a statue was erected to his memory, the expense being defrayed by a general subscription of all the teachers and pupils in the schools of Massachusetts.

Manual Instruction is a vague phrase for the different schemes wherein pupils are to be taught: (1) to use their hands as well as their heads, and (2) not to be ashamed of manual labour. In this sense writing, the mechanism of arithmetic, and drawing, form parts of all ordinary English education, whilst Gymnastics, Modelling, Turning, Slöjd (*q.v.*), &c., are gradually being introduced. Colonel Parker (*School Journal*, New York, December 10, 1887) defined manual training as 'one of several modes of thought-expression.' The mode of expression by means of language and symbol is most largely taught in schools. A second mode of expression by forms which exhibit the idea or ideal to some extent is seen in drawing. The third mode would use actual models, specimens, and things as free as possible from conventions. It would use these for its own purposes only, lest we should have the reverse-action fault which caused a youth to define 'an atom' as 'round balls of wood invented by Dr. Dalton.' Such plans assume (1) that the present systems of primary education are too 'bookish'

and unstimulating; (2) that the education begun in the primary schools should be continued in some form, more or less optional, and supplied, either from local or national funds, after the youth has passed the standards or has gone to work, usually without any knowledge of the most elementary facts and principles which underlie his work. A useful article in *The Spectator*, January 21, 1888, states that manual instruction has been recommended from three standpoints: (1) The increase of skill on the part of the workman. (2) The necessity of '*practical* teaching,' not 'book learning,' for the labouring classes. This is somewhat akin to the common answer of the Lancashire workman to his apprentice, 'Tha wants to know ta mich. Tha do exactly what a tell tha and tha'll do reet.' (3) The necessity of teaching by means of things as well as by notions. This standpoint is of course part of the general platform for the teaching of science, with experiments when possible, and with the object of training the faculties of observation and manipulative skill at the same time as the mental faculties. In this respect good work has long been done at a few English public schools, and notably Clifton College. In practical chemistry and physics the little manuals by Messrs. Shenstone and Worthington (Rivingtons) are instances of good pioneer work in our first-grade schools. The university colleges are making wonderful strides, and even at Oxford and Cambridge manual instruction, not only in physics but in engineering, may be obtained by the undergraduates. Thring led the way by instituting a carpenter's 'shop' at Uppingham. But the general lack of provision for practical work with mental discipline is patent in the majority of our schools. To headmasters it means trouble (especially until more teachers are trained), and to governors expense. Hence misapprehension exists. In the United States the cause of manual training is warmly taken up. The centre of activity is the *Industrial Education Association*, 9 University Place, New York; resident and first head of the Training College (1887), Dr. Nicholas M. Butler. The importance of the movement is seen by the fact that in its third year of existence it could take the old Union Theological Seminary at a rent of 1,200*l.* a year. Its fundamental article of faith is, 'That the complete development of all the faculties can be reached only through a system of education which combines the training found in the usual course of study with the elements of manual training.' The Association claims as a fact generally recognised, that the Kindergarten System (*q.v.*) produces the best results with young children, and it would combine a modified development of this system with ordinary book-learning. Industrial education comprises (1) technical education, (2) manual training. The Association desires to remove the wrong impression that manual instruction means teaching trades. 'The argument is psychological and educational. It is not economic or utilitarian.' It takes no account of the social and economic benefits known to result from manual training. The schools are not established for the purpose of teaching pupils how to make a living, but to teach them how to live. A wide-spread disinclination for manual labour is confessed; hence this supplementary, or rather complementary, movement is expected, in the words of the Report from Springfield, Mass., 'to foster a higher appreciation of the value and dignity of intellectual labour, and the worth and respectability of labouring men.'

Chicago has not only a Manual Training School, but a 'Women's Institute of Technical Design.' Generally speaking, where the manual feature has been introduced 'the kitchen and the sewing-room for the girls have held an equal place with the bench and the forge for the boys' (*Albany N.Y. Report*, October 3, 1887). The Americans seem to have been particularly impressed by the Imperial Technical School at Moscow, the pioneer in 1868, and Government commissioners have reported in the wake of the English Technical Commission. These reports, the scholastic journals, and the above Association, whose object is the creation of public interest and belief in the value of industrial education, should be referred to. The position of many thoughtful public men was thus given by the Governor of the State of New York in his last message to the Legislature (1877): 'The present system is insufficient for the future needs of our American youth. I would therefore recommend making manual training, within certain limits, a part of the public school system, certainly in the cities and larger

towns of this State.' (*See* Bain, *Science of Education*, pp. 169, 235–36, 272–80; George Combe, *Education: its Principles and Practice*, p. 313 (Macmillan & Co., 1869)—a posthumous edition by Mr. Jolly; and R. Galloway's *Education, Scientific and Technical* (Trübner & Co., 1881). Mr. Galloway gives many practical hints.)

Maps.—The rapidly increasing popularity of maps in newspapers, school text-books, &c., is intimately connected with the development of geographical teaching. It is a general fault that text-books are used too much, and maps too rarely. Even in distinguished schools it is too commonly supposed that the use of an atlas is quite analogous to the use of a dictionary. Yet all teachers are aware that to teach pupils to *read* a map intelligently involves considerable training, great pains, and the use of appliances. A map (from *mappa*, Latin, napkin, cf. the old titles *mappa mundi*, &c.) is not so much a pictorial representation of a portion of the earth's surface viewed from above, as a record of the larger and more permanent features of parts of the earth's surface, which is the standpoint of geography. These features are primarily recorded on physical maps, and they should be first used. The conventional distinctions between *charts*, *maps*, and *plans* should be noticed. It is not possible to classify the different sorts of maps here; the teacher must make the selection for his own purposes, basing subsequent meteorological, political, and historical investigations upon the physical and geological maps accessible. It is always unfortunate for pupils to have ordinary politically-coloured maps ('full-coloured' as publishers call them) placed before them in the first instance. This is a fault encouraged by limiting pupils to the use of one atlas; it serves to keep up the artificial barriers between 'political' and 'physical' geography, and produces bad effects in the study of history. Separate maps should be bought as they are needed. Teachers and pupils should also prepare maps for their own purposes. It is often most advisable to make a graduated series of maps in the same scale of any important country. The statigram maps, i.e. those marking statistics of a complex or political nature upon the ordinary physical features, would then naturally follow the latter. The logical order is well illustrated by Huxley's treatment of the Thames basin in his *Physiography* (Macmillan, 6*s.*). Detailed suggestions on the physical side of maps, &c., will be found in Geikie's book on *The Teaching of Geography* (Macmillan, 1887, 2*s.* 6*d.*).

Maps are the characteristic instruments of the geographer, just as much as *intra*-molecular structure is the special field of the chemist. Maps are also measures of the progress of geographical science. They should not, therefore, be hastily thrust upon the beginner, any more than they should be overlooked at later stages. From the topography of the neighbourhood is to proceed in the most natural way from the known to the unknown. Simple plans based on (i.) familiar bearings, and (ii.) the cardinal points, should lead to further knowledge 'out of bounds.'

Scale should be attended to at a very early stage. The maps of the Government Ordnance Survey (agents: Stanfords, Charing Cross, London, S.W., or local map publishers) should be used by the teacher, and introduced to the elder students. The usual English method of a scale of one inch to the mile is a reduction of $\frac{1}{63,360}$. These representative fractions are conveniently given on Continental maps in exact round numbers, e.g. 1: 20,000,000 for a small map of Europe. The metric system should not be neglected, and a table of comparison scales kept for use. It is well worth remembering that thirteen square, or eight linear kilometres equal about five English statute miles. The distinction between statute miles and geographical miles or knots should be carefully taught, and the latter preferred.

Localisation by means of meridians and parallels should come later, and the amount of geometry and astronomy to be taught is a matter of circumstances. The reading of maps as a selection of geographical matter is the first thing to be aimed at, and the constant reference of the geographer's material to *places* and to maps involves a supply, variety, and selection of the latter in schools which is not yet (1888) recognised by the majority of them. The public have also to learn to discriminate between good and bad maps. The publishers of good maps in Britain are few in number. Teachers should therefore encourage those who make cartography a speciality, and it will soon be found that British publishers are prepared to compete with the leading Continental ones. The

education of teachers in this matter will soon react on the publishers' stocks. Meanwhile the teacher should always make free use of the blackboard, globes, pictures, and occasionally, at least, of the magic-lantern.

Map-drawing is too much treated as a drawing, not a geographical exercise. Time and common sense are both against elaborate home lesson maps drawn on blank paper. The insertion of meridians *after* the outline defeats one of the objects of the lesson. Outline maps for 'filling in,' either in or out of school, can be purchased. The 'blank projections' sold are very useful in testing knowledge, or for use in school lessons on contours. Much greater variety with more intelligent system is needed. The chief object here should be to get pupils to know the main outline of the world as they know the multiplication table. Advanced students with some knowledge of mathematics may usefully acquire some of the elements of surveying, checking their results by the ordnance maps. Provided that principles and methods are studied, the work has much educational value, and is much practised in military schools. *The Proceedings of the Royal Geographical Society* contain papers by eminent travellers describing how their observations were made. Young men likely to visit comparatively unknown regions should learn the use of the chief instruments before they go abroad. Facilities are provided by the Society (Address: The Secretary, 1 Savile Row, London, E.C.). Intending travellers can now, by arrangement, be instructed in (1) surveying and mapping, (2) geology, (3) botany, (4) photography ; fee, 2*s.* 6*d.* an hour. The magnificent collection of maps is open free to teachers from 10 to 5, on Saturdays from 10 to 2 p.m. The Teachers' Guild (17 Buckingham St., Strand, W.C.) has a useful circulating library of books, &c., for its members. (*See* also MATHEMATICAL GEOGRAPHY.)

Map Projections. *See* MATHEMATICAL GEOGRAPHY.

Marking. *See* SCHOOL MANAGEMENT.

Mason College, Birmingham. *See* PROVINCIAL COLLEGES.

Mathematical Geography is an elastic term. It does not mean 'a description of the earth on mathematical principles,' nor even such portion of the field of geography as involves mathematics. In the latter case it would tread upon much physical geography and geo-physics, and upon the advanced treatment of political geography by the discussion of comparative statistics. The almost uniform subdivision of geography, like Ancient Gaul, 'in tres partes,' is familiar to every teacher. The opening chapter of text-books is usually devoted to mathematical geography. On the principle of proceeding from the known to the unknown this method is unscientific. It begins by asking a young student to disbelieve his senses, and then to accept a crude summary of what are strictly astronomical facts. This educational extreme was exhibited in the older generation by 'the use of the globes' as an advertisement for a ladies' school. We have the other extreme now in the infrequent use of globes. The true work of geography is to give answers to the question, Where? These soon lead to (1) the reading and (2) the making of Maps (*q.v.*). Teaching about meridians and parallels leads to inquiries about (1) *shape* and (2) *motions* of the earth. This may, of course, be indefinitely expanded into the domain of *Astronomy*. But the problems involved in the investigation of the earth's shape have conveniently been focussed around the subject of *Geodesy*. The standard book is Col. A. R. Clarke's *Geodesy* (Clarendon Press, 1882). This subject involves advanced mathematics, astronomy, and practical surveying. In connection with the *motions* of the earth, the main facts first and then the explanation of the facts of (i.) day and night, (ii.) the seasons, (iii.) air and water currents should be taught. (i.) and (ii.) are usually given in 'mathematical geography,' and (iii.) in 'physical geography.' *Tides* are, however, very mathematical, and even the bare explanations usually given involve a knowledge of the solar system and dynamical laws. *See* Prof. Haughton's *Manual on Tides* (Cassell & Co.). Hence the importance of teaching some simple elementary physics and mechanics before these matters are discussed. The use of orreries and other mechanical contrivances to teach planetary motions is a vexed question. If not dangerous in the hands of a skilful teacher, they are certainly very expensive and liable to easy derangement. It is better to spend money first on globes and maps. The mathematical principles of (iv.), climate, are closely connected with (i.) and (ii.). The advanced discussion has usually been claimed by

geological text-books. The teacher who is also a student will enjoy Croll's *Climate and Time*, where the controversies between the astronomers and geologists are summarised. But they proceed outside the sphere of the scientific geographer, except so far as the latter can deal with the problems of terrestrial physics.

Practically it will be found that *cartography* and *map projections* are more closely allied to geography, for they involve the most scientific answers to the question, Where? A very brief account of the principal projections is given in many text-books. Grove's *Primer of Geography* (Macmillan & Co., 1*s*.) shows what is possible for young pupils when the teacher begins to deal with a large portion of the globe at one view. There are some ingenious thread and wire models on sale, but ample scope exists for the ingenuity of teachers. The notions of projections do not come easily to most minds. The various schemes for 'projecting' the whole or less of the earth's surface on a flat paper surface have for centuries—with long intervals of neglect—taxed the ingenuity of astronomers. They form, however, the delights of the advanced mathematician or, in a small way, the business occupation of professional cartographers. Various military engineers and marine surveyors have also contributed to the study. There is a text-book in English by the late W. Hughes, who was both a geographer and a cartographer, *Treatise on the Construction of Maps* (Longmans, 1864), but the best treatises are in French, German, Italian, and Russian.

Mercator's projection is the only one here needing notice. It is most dangerous to use it exclusively. Its special purpose and the great exaggerations of area (about thirty-two times in lat. 80°) should be pointed out by the side of the globe and the hemisphere projections. In some of the late Keith Johnston's maps, in a map of the world published by J. Heywood, Manchester, and in others the projection is not, as at first sight, Mercator's, but Gall's, devised about 1840. Mr. Gall corrected the longitude at the forty-fifth parallel, and the exaggeration in important parts is only half that of Mercator's. It has other advantages. The difficulties of projection are humorously illustrated in Mr. Ravenstein's paper 'On the Reading of Geography' (*R. G. S. Report*, 1886—Educational Supplement). Mercator, i.e. Gerald Kaufmann, of Rupelmonde, near Antwerp, deserves honour from every true teacher. He was an ardent geographer, who lived a bright unselfish life, and did much for the progress of Europe. He spent his long life in producing the first *Atlas*, and allowed his friend Ortelius to first publish his volume of maps, *Theatrum Mundi*. Mercator had been working forty years at cartography before he put forth, in 1569, the projection which has immortalised his name. Before him the maps had been, during many centuries, without parallels, and even in the present century there have been gross absurdities in many maps. In schools where surveying is a subject the science of cartography is taught in some detail with the help of the British Ordnance maps and others. The use of such maps is also necessary to the practical geologist. Young travellers do well to consult the officials at the Royal Geographical Society, or otherwise to acquire practical knowledge of the use of observing instruments, &c., and of map-making under travelling conditions, and to take *Hints to Travellers* (Stanford, London, 5*s*.) with them. Teachers on the Continent sometimes have arrangements made for them to take pupils on observing tours. This is, of course, in cases where geography is made the subject of separate professorships; but in English-speaking countries this is not yet usual. The most practical side of 'mathematical geography' is seen in the training of commercial travellers, &c., to bring home adequate reports, or in training officers, such as the learned pundits of the Indian Survey Department, to make the best use of their chances of observation. *See* Col. Holdich on *The Art of acquiring Geographical Information* (*Asiatic Quarterly Review*, 1888, p. 154). The general literature on mathematical geography is scattered and not easily accessible. It is bound up with papers on mathematics, astronomy, and general physics. *See* MAPS; GEOGRAPHY.

Mathematics.—Although from its derivation the term might be descriptive of any species of knowledge which tends to improve the mental faculties, it is now well understood in a restricted sense, and denotes the science whose object is the discovery of the relations of number and magnitude, and their application to the explanation of natural phenomena by means of observed laws.

1. *The functions of Mathematics in Education.*—The educational utility of the study of mathematics is so generally acknowledged as to make its vindication here unnecessary. One of the primary effects of the study is the strengthening and training of the reasoning faculties. Acute reasoners in every branch of learning have acknowledged the use, we might almost say the necessity, of a mathematical education. It is desirable that the reasoning faculties should—at first, and before it is safe to trust implicitly to them—be exerted upon objects of such a nature that we can tell by other means whether the results which we obtain are true or false. Now the mathematics are well adapted for this purpose on the following grounds: (1) Every term is distinctly explained, and has but one meaning, and it is rarely that two words are employed to mean the same thing; (2) the first principles are self-evident, and, though they may be derived from observation, they do not require more of it than has been made by children in general; (3) the demonstration is strictly logical, taking nothing for granted except the self-evident first principles, resting nothing upon probability, and entirely independent of authority and opinion; (4) when the conclusion is attained by reasoning, its truth or falsehood can be ascertained by observation, or, as in geometry, by common arithmetical calculation. This means of testing and checking the processes gives confidence, and is absolutely necessary, while the reason is not to be the instructor, but the pupil; (5) there are no words whose meanings are so much alike that the ideas which they stand for may be confounded. Between the meanings of terms there is no distinction except a total distinction, and adjectives and adverbs expressing difference of degree are almost entirely avoided. Thus it may be necessary to say 'A is greater than B;' but it is entirely unimportant whether A is very little or very much greater than B. Any proposition which includes the foregoing assertion will prove its conclusion generally; that is, for all cases in which A is greater than B, whether the difference be great or little. Locke refers as follows to the distinctness of mathematical terms: 'The idea of two is as distinct from the idea of three as the magnitude of the whole earth is from that of a mile. This is not so in other simple modes, in which it is not so easy, nor perhaps possible, for us to distinguish between two approaching ideas, which yet are really different, for who will undertake to find a difference between the white of this paper and that of the next degree to it?' These are the principal grounds on which the utility of mathematical studies may be shown to rest, as a discipline for the reasoning powers. But the habits of mind which these studies have a tendency to form are valuable in the highest degree. The most important of all is the power of concentrating the ideas which a successful study of them increases where it did exist, and creates where it did not. A difficult proposition, or a new method of passing from one proposition to another, arrests the attention and forces the united faculties to use their utmost exertions. The habit of mind thus formed soon extends itself to other pursuits, and is beneficially felt in all the business of life.

Finally, another reason for the systematic study of mathematics is furnished by their connection with other sciences. As soon as any subject becomes a matter of strict measurement, or of numerical statement, it enters upon a mathematical phase. This phase may, or it may not, be a prelude to another in which the laws of the subject are expressed in algebraical formulæ or represented by geometrical figures. The process of reducing to formulæ is really one of abstraction; but long before such abstraction is completely attained, and even in cases where it is never attained at all, a subject may to all intents and purposes become mathematical. It is not so much elaborate calculations or abstruse processes which characterise this phase, as the principles of precision, of exactness, and of proportion. But these are principles with which no true knowledge can entirely dispense. 'If it be the general scientific spirit which at the outset moves upon the face of the waters, and out of the unknown depth brings forth light and living forms, it is no less the mathematical spirit which breathes the breath of life into what would otherwise have ever remained mere dry bones of fact, which reunites the scattered limbs, and recreates from them a new and organic whole.'[1]

[1] Spottiswoode.

Because of the wide application of the methods to other sciences and other fields of knowledge, mathematics must necessarily have great claims on the time available for education. It is necessary, however, to recognise the point of connection between these and other pursuits, for there is fallacy not unfrequently used which consists in giving a mathematical dress to reasoning which is not really mathematical in its nature, and so causing the argument to appear to possess the certainty of mathematics when such is not really the case. The limits to the range and influence of mathematics are described in the following eloquent words of the late President of the Royal Society, Mr. W. Spottiswoode: 'Conterminous with space and coeval with time is the kingdom of Mathematics; within this range her dominion is supreme; otherwise than according to her order nothing can exist; in contradiction to her laws nothing takes place. On her mysterious scroll is to be found written for those who can read it that which has been, that which is, and that which is to come. Everything material which is the subject of knowledge has number, order, or position; and these are her first outlines for a sketch of the universe. If our more feeble hands cannot follow out the details, still her part has been drawn with an unerring pen, and her work cannot be gainsaid. So wide is the range of mathematical science, so indefinitely may it extend beyond our actual powers of manipulation, that at some moments we are inclined to fall down with even more than reverence before her majestic presence. But so strictly limited are her promises and powers, about so much that we might wish to know does she offer no information whatever, that at other moments we are fain to call her results but a vain thing, and to reject them as a stone when we had asked for bread. If one aspect of the subject encourages our hopes, so does the other tend to chasten our desires, and he is perhaps the wisest, and in the long run the happiest, among his fellows, who has learnt not only this science, but also the larger lesson which it directly teaches, namely, to temper our aspirations to that which is possible, to moderate our desires to that which is attainable, to restrict our hopes to that of which accomplishment, if not immediately practicable, is at least distinctly within the range of conception. That which is at present beyond our ken may, at some period and in some manner, as yet unknown to us, fall within our grasp; but our science teaches us, while ever yearning with Goethe for "Light, more light," to concentrate our attention upon that of which our powers are capable, and contentedly to leave for future experience the solution of problems to which we can at present say neither yea nor nay.'

2. *The Classification of Mathematics for Educational Purposes.*—It has been usual to divide mathematics into two branches, *pure* and *mixed* (or applied). Where this distinction is adopted the different branches of mathematical science are classified as follows:—

I. Pure mathematics, consisting of the following branches: 1. *Arithmetic*, or the science of numbers, and arithmetical algebra, or the methods of calculation by means of general symbols having numerical signification only. 2. *Geometry*, treating of the properties of figures in the manner of Euclid's Elements. 3. *Algebra*, the calculus of operations. 4. *Analytical Geometry*, or the application of algebra to geometry. 5. *The Differential and Integral Calculus.*

II. Mixed mathematics, including the application of pure mathematics to (1) *Mechanics*, (2) *Astronomy*, (3) *Light*, *Heat*, *Sound*, *Electricity*, *&c.* According to this classification the pure mathematics include notions of time and space only, while mixed mathematics add to these, notions of matter. This distinction still lingers in the schedules of subjects for examination purposes, and on this account we cannot dismiss it without considering its meaning and the grounds on which it was made. Although the presence or absence of notions of matter was the essential difference between pure and mixed mathematics, yet in addition to this distinction there was supposed to be a difference in the nature of the evidence on which the truth of the first principles depended. In every department of mathematics the results are obtained by strictly logical deduction from a few first principles explicitly assumed, but in so-called pure mathematics the first principles were supposed to require no special inductive process to convince us of their truth. Whether, as some assert, they are notions inherent in the mind, or, as others maintain, they are deductions from

our constant experience, they are universally allowed to be self-evident in the sense that we cannot conceive them to have been otherwise than they are.

The so-called mixed mathematics apply the conclusions and processes of pure mathematics to natural objects, and consequently presuppose some knowledge of the properties of these objects derived from the senses. But a little observation will show that the logical or strictly mathematical processes of deduction in the pure and mixed mathematics are identical, the difference between the two sciences being, not in the rigidity of the reasoning, but in the independence of the principles, or their connection with other laws and facts. In mixed mathematics we are often presented with conclusions derived from hypotheses regarding the constitution of nature. If we ask whether these are correct conclusions from the assumed hypotheses, our investigations must be conducted on principles purely mathematical; but if we inquire whether the conclusions have a real existence in nature, we must appeal to observation. It is from this mixture of mathematical deduction with experimental processes that the mixed sciences derive their name, and not from any difference between their mathematics and those of the pure science. While therefore it may not be inappropriate to speak of mixed sciences, that is to say sciences partly mathematical and partly experimental, there is an inappropriateness in classifying these sciences as mixed mathematics.

Again, the term *pure* is used in connection with geometry as opposed to analytical; *pure* geometry being that which proceeds on the Euclidean plan of reasoning directly from the figure, without the use of any system of co-ordinates or lines of reference. Now, both pure and analytical geometry are included under the old division of pure mathematics, so that there is here confusion of terms, and we must conclude that they are both vague and unnecessary.

More appropriate or more accurate plans of classification have been suggested; for instance, Mr. R. W. Hayward, of Harrow, proposes to classify according to processes, and not according to subject matter, and considers that the correlation of the different branches of elementary mathematics is best exhibited by grouping the ideas about the Hamiltonian concepts scalar and vector. But it must be remembered that a large amount of mathematical knowledge was needed before these generalisations could be made, and much is required before they can be properly understood. There is, however, something to be learnt for our purpose from the suggestion, as will appear from a brief explanation.

The operation of passing from any point O in space to any other point A is termed a vector, and denoted either by two letters, as O A, or a single symbol a, which must be regarded as involving the conceptions of length and direction, but not of position in space; so that two vectors O A and O′ A′ will be equal if by simply moving the line O A parallel to itself, until O coincides with O′, its other extremity A falls upon A′. The addition of vectors is defined by the ordinary equations O A + A C = O C, which may be interpreted as indicating that the successive performance of the operations O A, O C is equivalent to the single operation O C. Thus the diagonal is the geometrical sum of the adjacent sides of a parallelogram or of a parallelopiped. The reverse operation to A B is denoted by − A B, and is equivalent to B A, since by the above relation

$$A B + B A = A A = 0.$$

Hence a *vector* is a directed line of definite length in space. A *quaternion* is a ratio of vectors. A *scalar* in the language of quaternions is a positive or negative number. Now the proposal we have referred to is that we should classify the mathematics, and develop them by reference to this Hamiltonian distinction. It is supported by the following considerations:

That which is strictly mathematical in the treatment of any science is not its subject matter, but the *form* in which that subject matter must from its nature be expressed. Mathematics, as such, is in fact a *formal* science, concerning itself with the particular matter only so far as that matter necessitates a particular form for its expression. Hence the recurrence of the same formulæ and mathematically the same propositions in different branches of science, so that, to take elementary instances, a proposition in geometry may be read off as a proposition in statics by substituting forces for lines, or the formula which determines the speed of the centre of mass of two masses having different speeds is also that which determines the temperature resulting from the mixture

of two masses of different temperatures. Now by the plan suggested each proposition will be proved in a form which will admit of direct application to all the branches of science into which it enters. It is rarely an advantage to present the result of an extensive generalisation before the materials for making it have been acquired. No power accompanies the possession of a generalised truth which is thus prematurely put forth. It is much better, for example, to teach mechanics in its earliest stages by such apparently special processes as the Parallelogram of Forces, and such special terms as *composition* and *resolution*, *component* and *resultant*, and then to use the results with others of like kind to establish the theory of quaternions—it is much better to adopt this course than to introduce the generalised notion of vectors in the beginning, and to overwhelm the young student by extending too rapidly the meaning of such operations as addition and multiplication.

Yet the suggestion is to a certain extent practical, and to this extent will be followed in the section on the Methods of Teaching. We shall there take up two lines corresponding to a great extent to the two suggested, but without requiring a too rapid generalisation.

3. *The practical utility of Mathematical Education.* — Before proceeding further with the question of methods of teaching, it will be convenient to consider some apparent differences in the views of advanced thinkers in regard to the idea of utility as a motive for mathematical study.

Mathematics connect themselves on the one side with common life and the physical sciences, on the other side with philosophy. The reason for the difference to which we have referred is that some dwell more on the one aspect than the other. Where advanced professors are divided, the teacher of the elements has to accept and reconcile as far as possible the views of both sides. For instance, in two addresses at the same meeting of the British Association (at Southport) we find a Cambridge professor in one appearing to imply that mathematics are degraded by association with the arts and sciences. He says, 'If I were making a defence of mathematics I should desire to do so in such a manner as in the "Republic" Socrates was required to defend justice—quite irrespectively of the worldly advantages which may accompany a life of virtue and justice, and to show that, independently of all these, justice was a thing desirable in itself and for its own sake—*not* by speaking to you of the utility of mathematics in any of the questions of common life or of physical science. I would rather consider the obligations of mathematics to these different subjects as the sources of mathematical theories now as remote from them and in so different a region of thought as a river at its mouth is from its mountain source.' At the same meeting another professor, not of Cambridge, says: 'By the neglect of pure geometry and its applications to geometrical drawing, Cambridge has lost, or rather has never had, contact with the practical needs of the nation. All the marvels of modern engineering have sprung into existence without her help. The great engineers have had to depend to a degree now unheard of upon costly experiments until they themselves gradually discovered mathematical methods adapted to their purposes.' Now the teacher of elementary mathematics has to recognise the needs of the engineer as well as those of the purely mathematical philosopher. The latter is apt to look on the vast extent of modern mathematics as 'an extent crowded with beautiful detail, not an extent of mere uniformity, such as an objectless plain, but of a tract of beautiful country seen at first in the distance, but which will bear to be rambled through and studied in every detail of hillside and valley, stream, rock, wood, and flower.'[1] The former looks upon the same tract with the view of developing its resources for the benefit, sustenance, and comfort of the human race. But these views are not necessarily antagonistic. Mathematical theory is in the first instance suggested by questions of common life or of physical science; while it is being established in the mind of the young student, and is giving strength and confidence to his reasoning powers, it cannot be separated for long together from the region of experiment and observation, for, as we have said, in the ease by which its conclusions may be tested rests its chief utility as a mental discipline. When, however, the instruments by which it operates have been fully proved, it may be pursued and

[1] Professor Cayley.

studied quite independently of its applications to common things. The history of mathematics, however, shows us innumerable cases in which, after the independent course has been pursued, perhaps for a long interval of time, it closes contact again with the practical, and in return for lending its aid is itself strengthened by the contact. Hence history forbids any one to predict that even the most abstract and imaginary of the branches of advanced mathematics has diverged so far from the practically useful that the two cannot be expected to meet again. Consequently, although the needs of engineers and others who practically apply the truths and theories of the science must not be lost sight of, yet they must not by any means engross the whole aim and attention of the mathematical teacher. Even such notions as imaginary quantities, manifold space, and non-Euclidean geometry, do more than furnish mental exercise and recreation, and it is always within the range of possibilities that they may lead to new points of contact between mathematics on the one hand and the arts on the other.

4. *Methods of Teaching.*—When the educational purposes, and the present condition of mathematical thought, which we have so far considered, are taken into account, we are led to the following conclusions as regards methods of teaching the subjects. It is best to arrange the mathematics in two parallel lines, one containing subjects allied to pure geometry and its applications, and the other to those allied to pure algebra and its applications. A very few considerations will be sufficient to show that these two lines should proceed together. Many minds prefer to build upon the 'intuition by inspection' rather than upon the arithmetical connection of symbols of quantity. They prefer that the truths of mathematics shall be cast in a mould which connects them with concrete things rather than with abstract notions. Others may, on the other hand, find that for them algebra has the greater power. One algebraical theorem, by being read in different ways, by giving ever different meanings to the symbols, reveals a variety of geometrical and other theorems. It is the crystallised form, and very essence of the mathematical truth, but in the most abstract form conceivable, the most perfect form which mathematical truth as such can assume. But even the men whose days are spent in research in this subject, and who are the discoverers of the highest theorems of modern algebra, constantly make use of geometry to assist them in their investigations.

It is not easy to decide which course should commence first. Mathematics naturally begins by treating magnitudes with reference to the single element of quantity. The answers to the simple questions, How many? How much? How much greater? How many times greater? lead up to the arithmetic of abstract and concrete number, and the doctrines of ratio and proportion, and the development of these with the use of the signs +, −, &c., as signs of the elementary operations, and letters to denote numbers or ratios, naturally leads to generalised arithmetic, or arithmetical algebra.

But geometry cannot be far behind, if, indeed, it does not have the start: simple geometrical teaching may begin in the nursery, and is, indeed, already a most important element in kindergarten instruction. Its growth should, however, be continuous from this point. Algebra, however, can begin only after arithmetic has been carried to fractions and proportion. From the beginning of algebra the two courses should be allowed to assist each other. As they extend, each will grow into the other until there will exist really no essential difference between the two. Geometry will then be only one manifestation of algebra, and algebra, at least as regards its dimensions, will be contained in geometry. Moreover, there will be great advantage in the frequent importation of the methods of one course into the other. The teaching of algebra too often lacks the features which are too rigidly maintained in geometry. Indeed, it is often charged against the method of teaching the latter that too much is sacrificed to logic, and too much time is spent in axioms and definitions which are not at first required, though to the beginner a more rapid dive into the subject would be much more suitable. In algebra, on the other hand, the boy is at once plunged into the midst of it. No axiom is mentioned. A number of rules are stated, and the schoolboy is too often made to practise them mechanically until he can perform a number of complicated calculations which are often of very little use for actual application; until the

poor student really thinks that solving a simple equation is but the going mechanically through a certain regular process which at the end yields some number. The connection of that number with the original equation remains to his mind somewhat doubtful. There can be no doubt that a rapid progress, with perpetual return to pick up, re-examine, and use difficult and at first partially understood operations, is the best method of teaching this subject. The motto, 'the slower the surer,' does not apply here. On this point Professor Sylvester gives his opinion thus: 'I should rejoice to see mathematics taught with that life and animation which the presence and example of her young and buoyant sister (viz., natural and experimental science) could not fail to impart; short roads preferred to long ones, morphology introduced into the elements of algebra; projection, correlation, motion accepted as aids to geometry; the mind of the student quickened and elevated, and his faith awakened by early initiation into the ruling ideas of polarity, continuity, infinity, and familiarisation with the doctrine of the imaginary and inconceivable. It is this living interest in the subject which is so wanting in our traditional and mediæval modes of teaching.'

The order in which the various parts should begin will in ordinary circumstances be as follows, it being understood that the parts which have been first commenced are not suspended in the opening of another branch.

Allied to Algebra	*Allied to Geometry*
Arithmetic	Kindergarten Geometry
Arithmetical Algebra	Relations and Measurement of Simple Figures
Algebra	Euclidean Geometry
Trigonometry	
Algebraical Geometry	Geometrical Conica
Kinematics	Graphic Statics
Dynamics (including Kinetics, and General Statics).	
Mathematical Physics	
The Theory of Equations	Solid Geometry
The Infinitesimal Calculus	Projective Geometry

Mathematics have steadily advanced from the days of the Greek mathematicians. They are cumulative in character, and nothing is lost or wasted. The advances made in the past half-century have been enormous, and the field still seems boundless. Now the more we can introduce the modern ideas and methods into the elements without disturbing the natural order as regards mental development the greater will be the practical result of the diligent study and research which has recently enriched the science. But teachers have a claim on original investigators to consider the needs of education, and not to cast their conclusions in such a form as tends to mystify the uninitiated. The rapidity with which new terms are invented and used, it may be only for a time, in such a way as to make the advanced parts of the science as a sealed book to the mass of students, is not in the interests of education and needs to be checked.

Matriculate (*matricula*, a public roll or register), to be enrolled as a member of a college or university. The regulations for matriculation vary in different universities. In some of the teaching universities matriculation is a mere form, though in others, and especially in those universities which are only examining bodies, a qualifying examination has to be passed before candidates for matriculation can be accepted.

Maurice, John Frederick Dennison (*b.* 1805; *d.* 1872), an English theologian and educationist, was the son of a Unitarian minister. Himself a Unitarian, he joined the ranks of the Church of England in 1829, mainly through the influence of Coleridge, repaired to Cambridge to take his degree, from which he had hitherto been debarred on account of his being a nonconformist, and subsequently entered orders. Ordained in 1834, he was appointed chaplain to Guy's Hospital, London, and became thenceforward a sensible factor in the intellectual and social life of London. In 1840 he was nominated to the chair of history and literature in King's College, London (1840–53), and in 1846 to that of divinity (1846–53), and elected chaplain of Lincoln's Inn (1846–60). In 1853 he published his *Theological Essays*, which were considered to expound certain unsound dogmas as to eternal punishment, and he was in consequence deprived of his chairs in King's College. His residence in London was identified with the two great movements for the higher education of working people, viz. the Working Men's College, Great Ormond Street, and Queen's College for the education of women. These colleges are still full of his spirit, for Maurice intended to give, not what is called a popular education, but a higher

education, to working men and women, and he aimed at combining teachers and taught by a bond of common interest. He threw himself into all that affected the social life of the people, and the immediate outcome of his teaching was certain efforts at a true co-operation among working men and the movement known as Christian socialism. In 1866 he was elected Professor of Moral Philosophy at Cambridge.

Mayo, Dr. *See* HOME AND COLONIAL SCHOOL SOCIETY

Melanchthon, Philipp (*b.* 1497; *d.* 1560), the friend of Luther, and the 'Preceptor of Germany,' as he was called, is remarkable mainly as the many-sided polished scholar, and the guide of adult minds eager for the new learning of the Renaissance. (*See* RENAISSANCE and REFORMATION.) He was educated at Heidelberg and Tübingen, and from the age of twenty-one till his death held the post of Professor of Greek at Wittenberg. He wrote grammars on Latin, Greek, and Hebrew (the Latin grammar ran through fifty editions), and many manuals (logic, physic, ethics), which are for the most part introductions to a better understanding of Aristotle, whose exclusive hold on liberal education was renewed in Germany for another century by his influence. In his *School Plan* the most noticeable feature is his strong insistence on the importance of grammar and the necessity for learning it carefully by heart—a view which has widely and disastrously influenced all language-teaching ever since. Startling as it may appear, children who could not read their mother-tongue are to be taught at first nothing but Latin (in *Donatus* and *Cato*), and music. Greek and Hebrew are to be added at the university. For the older boys at school verse composition is introduced; and the masters are to be strictly required to converse with their pupils in Latin only. There is to be much learning by heart of Terence, Plautus, and Virgil; and Cicero's Offices and Letters, and Ovid's Metamorphoses are also to be read. Religious instruction is, of course, not neglected, and one day in the week is set apart for Christian instruction and the grammatical exposition of St. Matthew's Gospel. Older boys may read the Epistles. Through his pupils Trotzendorf and Sturm, Melanchthon may be said to have founded the classical school-plan, which has lasted to our day on his lines, with the addition of Greek in the sixteenth and seventeenth centuries. The one thing to do at school was to learn Latin. His school period, however, corresponds to our years at a 'preparatory' school; while in his plan for later education he is much more open-minded. He lays under contribution all the departments of the knowledge of his day, and sets forth the conception of a truly liberal and many-sided education. (*See* REFORMATION.)

Memory.—This term indicates the mind's power of retaining impressions so as to be able to recall them for after use. The fundamental property of memory, called by psychologists retentiveness, underlies all acquisition, whether of knowledge or of moral habit. It is connected with a common physiological property of animal organisms, by reason of which they are modified by, that is, conserve traces of, previous activity. In its highest development as the faculty of memory this power of retention lies at the base of all learning. It is governed by its own laws, chief among which are the laws of interest and attention, and those of association (*see* ATTENTION and ASSOCIATION). It is one of the first powers to be developed, and as such claims the teacher's attention at the outset. Although in general strong in children, it presents itself with well-marked individual differences in respect both of the general or average power of retaining, and of the retention of special varieties of impressions and knowledge. The importance of the faculty, as *par excellence* the organ of learning, has led to an excessive attention to it by educators. The memory has been cultivated for its own sake, and not, as Kant and other recent writers have rightly urged, as a necessary support of the higher faculty of judgment. Moreover, these pains have, as a rule, only been taken with one sort of memory, viz. the retention of words or the verbal memory. The modern movement in educational theory has been to a large extent a protest against mere rote learning, and a setting a knowledge of things before that of words. The cultivation of memory on all sides must ever remain a chief part of the teacher's work. And it is the recognition of this fact that still gives to the problems of exercising and improving the memory their educational significance. It is now commonly admitted that though retentiveness

is a limited force in the case of every individual, much may be done to aid and improve the memory by appropriate exercises, by inculcating habits of concentration, orderly arrangement of materials, &c. (*See* MNEMONICS.) On the nature and cultivation of the memory *see* Dugald Stewart, *Els. of the Phil. of the Human Mind*, pt. i. chap. vi.; Bain, *Education as a Science*, p. 20 and following; Sully, *Teacher's Handbook*, chap. ix. and x. with references at the end.

Mercator. *See* MATHEMATICAL GEOGRAPHY.

Merit Grant. *See* PAYMENT BY RESULTS.

Method.—By method (*μίθοδος*, *μετὰ* and *ὁδὸς*) is meant the way in which we proceed to attain any object so far as this can be formulated in definite rules. Method has thus to be distinguished from a mere orderly sequence, which may be simply a traditional rule-of-thumb manner of proceeding. Every true art possesses its method. In its logical signification method may be defined as the art of arranging our thoughts, whether for the purpose of discovering truth or for that of making it known to others. In this sense method or methodology is sometimes marked off as a special department of logic. This double object gives rise to one main distinction of method, viz. that of discovery and that of instruction. Another distinction of method related to this is that between the inductive and the deductive method, the first of which proceeds by examining particular instances and deriving the general principle or rule from these, whereas the second follows the converse order of deducing particular results from general principles. (*See* DEDUCTION and INDUCTION.) These two modes of distinguishing method must not be viewed as identical. The discovery of truth, though to a large extent proceeding by induction, requires deduction as a supplementary process. On the other hand, the true method of instruction must combine the inductive process of detecting general rules through and by means of concrete examples with the deductive explanation of new facts by the aid of general truths already learnt. Another distinction of method related to that of induction and deduction is that known as analysis and synthesis (*see* ANALYSIS). In addition to these fundamental distinctions we find writers on education speaking of other varieties of method. Thus we have the contrast between the empirical and the rational or scientific method (*see* EMPIRICAL METHOD); the distinction between the intuitive or concrete and the abstract method, between the heuristic or inventive and the dogmatic method, and so forth. It can easily be shown, however, that these distinctions, so far as they embody a real difference of logical method, and not merely a difference of mode or manner of proceeding, take us back to the fundamental distinction between induction and deduction, that is to say, the setting out with concrete fact or example and with abstract principle. (*See* Jevons, *El. Lessons*, xxiv.; Compayré, *Cours de Pédagogie*, pt. ii. sec. i.; Schmidt's *Encyclopädie*, art. 'Methode.')

Middle Ages (Schools of the).—The social conditions under which people lived in the Middle Ages were such that, except for those intended for ecclesiastical offices, education was not only not a necessity, but even a superfluity. Accordingly we should expect to find that the first schools brought into existence when Western Europe emerged from its political and social convulsions into comparative repose would be ecclesiastical in character, and that for many years these would be the only schools. We should further expect to find that, where the desire for some intellectual training arose among the laity, it would first show itself among the leisured and wealthy classes, in the courts of princes and the castles of nobles. This natural process of development is the actual one. Passing over the earlier and more spasmodic efforts to train candidates for the priestly office, it will be sufficient here to start from the first organised effort in this direction made by the great founder of Western monasticism, St. Benedict (480–542). The monasteries under his rule included within their precincts schools—schools in the oldest and widest sense of the term, not as now limited in the age of the scholars and the range of the instruction—where the regular clergy themselves attended for instruction as part of the discipline of the monastery, and also where the young children and youths dedicated by their parents to the religious life were prepared for the strict profession which they would in due course adopt. It is natural, and, as far as can be gathered, it is the case, that the

monastic theory of education in those times entirely excluded attention to secular learning. Gregory the Great (544–604), who was such a zealous supporter of the Benedictines, undoubtedly opposed any such inclusion; and the energies of Archbishops Theodore and Hadrian, the patrons of clerical education in England in the seventh century, though vigorously directed to the education of both the regular and secular clergy, were equally vigorously directed against the introduction of secular learning into their scheme of education. Coming to the eighth century, the names of Bishop Aldhelm, himself educated at Hadrian's monastic school at Canterbury, and of the 'Venerable' Bede, also educated at Canterbury after passing through the monastic schools at Wearmouth and Jarrow, stand out conspicuously as the promoters of education in England. The former founded a school at Malmesbury, and the latter the famous cathedral school at York, which not only opened its doors to the secular clergy, but also soon expanded its curriculum to include the more liberal studies, such as the 'pagan' Latin and Greek writers. Here Alcuin (735–807), who was not a monk, and was a widely-read Greek and Latin scholar, was educated, to become the most learned man of his age. His reputation was such that Charlemagne sent to York to implore his assistance in the efforts the great king was then making for the revival of letters in France; and there is no doubt that the monastic and cathedral schools founded in France under Alcuin's influence have had lasting results upon the progress of education all through Western Europe. But Charlemagne went further, and the next step in the extension of the field of learning was reached by his earnest promotion of *lay* schools.

Education had become, at last, a desired luxury, if not a necessity, for the ruling classes; and Charlemagne instituted the *palace* school, where the children and youth of the king and his nobles could be prepared in all courtly accomplishments, which were now no longer confined to proficiency in the old unintellectual pastimes, but which included literature, especially poetry, music, and the fine arts.

This step of Charlemagne's marks a distinct epoch in the history of education, and henceforth we note, by a distinct and easy transition, the development of liberal education both in England and France, the widening of the curriculum in monastic and cathedral schools themselves, and the extension of their advantages to other classes of society downwards through the social scale. The monasteries and cathedrals added to the scope of their functions already named that of training the young of the laity residing in their neighbourhoods, now every day growing more and more populous. Accordingly we find two kinds of schools existing: the internal school for the clergy and those preparing for the profession, which was situated within the precincts of the cloisters; and the external school for the laity, which was held in a building outside the monastery or cathedral proper, but usually within its precincts. And then another development took place. As monasticism declined, and education fell almost exclusively into the hands of the bishops and secular clergy, the range of liberal studies became further enlarged, and a consequent increase in the complexity of school education followed. The disadvantages arising from the training of both the young and the adult in the same school became increasingly obvious; and the principles of the division of labour and centralisation were called into action to produce the desired improvement. First the bishops, and then, following their example and actuated by similar motives, the nobles, founded those schools for the more adult students, and for the highest education, at Oxford and Cambridge in England, at St. Andrews in Scotland, and elsewhere, which we know under the name of Universities, but which still retain in their local nomenclature the fact that they are, in the old sense of the word, 'schools,' like the 'school at Wittenberg,' to which Shakespeare makes Prince Hamlet desirous of proceeding.

The colleges, as places for the residence and supervision of the students attending a university, must be looked upon as institutions naturally, but not necessarily, arising out of the conditions under which students from all parts of the country attend a central place of instruction. The university was the school in connection with which each college was the 'boarding-house.' A university can exist without colleges; it is the cause of their existence, not its effect. This conception of the university as an institution not in-

dependent of school, but part of school, really the highest and final stage of school, is most conspicuously apparent by the action of Bishop William of Wykeham, who conceived simultaneously (A.D. 1370) the boarding-house and school, comprising his college at Winchester for boys up to sixteen or seventeen years of age, and the boarding-house at Oxford, known as New College, for those of his scholars at Winchester who intended completing their scholastic studies at that university. The whole movement was alike a protest against the illiberal conception of school fostered by the monks, which had narrowed, rather than widened, under their growing demoralisation, but was also a tangible proof of the enlightened conviction of the bishops that the standard and character of the education of the English gentleman must be raised more and more if he was to fulfil the duties devolving upon him. And Bishop Wykeham does not stand alone. The same large-minded scheme presented itself in the next century to Bishop Chichele, who founded All Souls, Oxford, in connection with his school at Higham-Ferrers, in Northamptonshire; to Bishop Waynflete, who founded Magdalen College, Oxford, and connected with it both Magdalen College School at Oxford itself and his Grammar School at Waynflete, in Lincolnshire; and notably to Henry VI., who erected and endowed within a few years of each other King's College at Eton (1441) and King's College at Cambridge (1446).

The movement to meet the educational needs of the burgesses and traders in the towns—the middle classes, as we now term them—comes next in historic order, and must be briefly touched upon. This portion of the community, wholly left out of account by the monasteries, was not altogether lost sight of by the cathedral chapters. The inhabitants of the cathedral cities themselves, of course, enjoyed all that the learning of the cathedral clergy could supply; but, in some dioceses, the cathedral authorities established branch or subordinate schools in other towns, which were known as collegiate schools. At the same time it was to the friars, or mendicant orders, that the trading classes are chiefly indebted for the educational advantages which reached them by their efforts in the thirteenth and fourteenth centuries. The work of the Franciscan or Dominican was not carried on in the retirement of cloisters, but in the busiest haunts of men; and they inspired a religious revival in the towns, which created, as a necessary consequence, a consciousness of ignorance and a thirst for knowledge. The trade guilds, organisations which had in their inception the sole purpose of regulating trade dealings, protecting trade interests, settling the conditions of apprenticeship, and acting as a court of appeal in trade disputes, became also, under the influence of the friars, organisations for spiritual ministration by the erection of chantries and the maintenance of preaching friars and secular priests, for the offering of masses for the faithful departed, for the exercise of Christian charity towards the aged and infirm, and, finally, for the education of the young. The guild of Corpus Christi at Cambridge is a case in point. Founded originally as a purely trade guild in Edward I.'s reign, it obtained in Edward III.'s reign (1352) letters patent enabling it to acquire and manage a house of scholars, chaplains, and others, which is now known as Corpus Christi College, Cambridge. The growing thirst for knowledge among the townsfolk reacted upon the friars themselves, and they sought admission and obtained a welcome at the universities. There they applied themselves with ardour to the studies of the place, and became consummate masters of rhetoric and dialectics. What knowledge of the physical laws of the universe was then possible to the world became their inheritance by right of earnest and untiring intellectual effort. Thomas Aquinas (1227–1274), the most learned of the 'schoolmen,' and Roger Bacon (1214–1292), the greatest physicist of the Middle Ages, were both friars, while Simon de Montfort (1206–1265), who must have been conspicuous among his fellows in these early times for the keenness of his political instinct, was a pupil of the friars. Besides the schools above mentioned, the following are some of the schools which were in existence at the time of the Schools Inquiry Commission 1862–68, and which date their original foundation as far back as the Middle Ages:—Carlisle (*temp.* William II.), Derby (1160), Huntingdon (*temp.* Henry II.), Salisbury (1319), St. Davids (before 1363), Hereford (before 1385), Penrith (1395), Oswestry (*temp.* Henry IV.), Sevenoaks

(1432), Ewelme (1437), Wye (1447), Rotherham (*temp.* Edward IV.).

It remains to give some account of the curriculum of the schools of the Middle Ages. The complete course of education comprised the seven so-called liberal arts—grammar, dialectic, rhetoric, music, arithmetic, geometry, and astronomy, the uses of which were set forth in the well-known lines—

Gramm loquitur, *Dia* vera docet, *Rhe* verba colorat,
Mus canit, *Ar* numerat, *Geo* ponderat, *As* colit astra.

The three first formed the *trivium*, the four last the *quadrivium*, the whole making a course of at least seven years. Religion, as a subject of study, is not expressly mentioned, because it was universally regarded as the object and crown of the whole system. But only those monastic and cathedral schools which were organised to do the work now undertaken both by the school and the university attempted the complete course; indeed, it is doubtful whether the large majority even of these schools went beyond the *trivium*, except the select few who made it their function to give that special training to those of the regular or secular clergy who were qualified to receive it, and who, as the 'schoolmen' of the eleventh to the fourteenth century, made their names famous for their application of Platonic and Aristotelian dialectics to their schemes of speculative theology. And even of the *trivium*, the first subject, grammar, principally Latin, imparted from the works of Priscian and Donatus, was the only one taught to the youths of the neighbourhood of the monastery or cathedral in the *external* schools provided for them. Hence, although the term 'grammar school' does not occur in deeds of foundation until that of Magdalen College School, founded by Bishop Waynflete (1480), yet the references to these schools in contemporary records contain no allusion to any other subject of instruction than grammar, except occasionally music, and, in the case of chorister and cathedral schools, also chanting.

One other point is worthy of notice—all the schools of the Middle Ages, with only a few expressly noted exceptions, gave education gratuitously. Their principle is expressed in the line—

Discere si cupias, gratis quod quæris habebis.

The scholars for whom the monastic and cathedral schools were provided were of no one class in particular, but comprised all the children or youth of the neighbourhood who desired an education based on grammar. Among these would be some of all classes, and naturally only a few of the labouring classes. But the opportunity of education was open to all. In some instruments under the seal of the founder, as that of Wye, founded by Archbishop Kempe in 1447, the school is distinctly stated to be 'a college for the instruction of youth, gratis, both rich and poor.'

The example thus set by earnest men interested in education in the Middle Ages was followed by the earliest founders of the Reformation and post-Reformation periods. The grammar schools of the Tudor period, whether revived on the ruin and decadence of the monastic schools, or newly endowed by the educational zeal of the 'Revival of Learning' (*q.v.*), were free schools, in the sense of affording education gratuitously. In another way also we can trace the influence of the school system of the Middle Ages. The grammar of the *trivium* was the germ from which the *humanistic* education of our English schools, holding the field almost exclusively down to our own day, was developed. This first of the liberal studies, elaborated and perfected by the scholars of the Reformation, constituted the main—it may fairly be said the only—educational instrument for the intellectual training of Englishmen for three centuries afterwards. An interesting and detailed account of the system of endowed schools founded since the Reformation may be found in vol. i. of the Report of the Schools Inquiry Commissioners, published in 1868.

Middle-class Schools.—In the year 1858 a Royal Commission was appointed to inquire into the education of boys and girls of the labouring class. In 1861 a second Commission was appointed to report on the nine greater public schools (*q.v.*) of the country. These inquiries, however, did not cover the whole ground; and so in 1864 a third Royal Commission was appointed to inquire into and report on all the schools not included in the reports of the former commissions. The work of this third Commission extended over the years 1865–67, and the results of the investigation appeared in 1868 in a Blue-book of twenty volumes. Upon this report was founded the 'Endowed

Schools Act' of 1869, which gave authority first to the 'Endowed Schools Commissioners,' and afterwards to the 'Charity Commissioners,' to frame new schemes for the better working of the schools dealt with by the inquiry, and, where advisable, to divert to the benefit of the schools other endowments not originally educational. The report, amongst other things, recommended that the schools should be marked off into grades, according to the prevailing type of education to be given in each. This type should mainly depend upon the length of time the children were allowed by their parents to remain at school (*Report*, vol. i. p. 15). The grades recommended were: *third-grade* schools, for those whose education is to stop at the age of fourteen or fifteen; *second-grade*, for those remaining up to sixteen or seventeen; and *first-grade*, for those continuing their education up to eighteen or nineteen. With regard to the *second-grade* schools the report advises that they should 'prepare youths for business, for several professions, for manufactures, for the army, for many departments of the Civil Service. Many of the farmers, many of the richer shopkeepers, many professional men, all but the wealthier gentry, would probably wish to have their sons educated in schools of this sort, if the education were thoroughly good of its kind.' 'Latin would be a necessity in all but a very few of these schools, since most of the occupations presuppose it in some degree, and many of the examinations prescribe it.' In addition to Latin, one or two modern languages, English literature, and mathematics (practical), should be taught (*ibid.* vol. i. p. 84). *Third-grade* schools should train boys to become skilled artisans by providing them with 'that basis of sound general education on which alone technical instruction can rest' (*ibid.* vol. i. p. 79). They would supply the needs of artisans, smaller shopkeepers, and smaller farmers, and generally of 'the whole of the lowest portion of what is commonly called the *middle class*.' In them should be taught reading, writing, arithmetic, English grammar, English history, either some modern language or the elements of Latin, drawing, and a little mathematics (*ibid.* vol. i. p. 80). The basis of *length of time at school* on which these grades rested was a sound one; but the division between the second and third grades did not prove to be rightly placed, either with respect to subjects or parents; and hence schools of an *intermediate* type came more into vogue, to which unfortunately the title of 'Middle-class Schools' has commonly been given. After the 'Elementary Education Act' of 1871 was passed, and schools of the third grade were practically handed over to the care of the State, the need for *middle-class schools* became greater than ever. In the best of these schools Latin is now an optional and extra subject, the other subjects being: French (and sometimes German), English language and literature, English history, geography, mathematics (practical and theoretical), physical science, drawing, vocal music, reading, writing, and arithmetic. Of late years these schools have been and are very largely used by the cleverer boys from the elementary schools who have passed the fifth, sixth, or seventh standard, and their curriculum and organisation are consequently undergoing a new development. (*See also* an excellent pamphlet on *Middle-class Education*, by J. B. Lee, Rivingtons, 1*s*.)

Milton, John (1608–1674), known to his own age chiefly as a vigorous political pamphleteer and a learned theological controversialist, and to all after ages as the author of *Paradise Lost*, has here to be considered only as a schoolmaster; the most notable man, we may safely assert, who ever pursued the 'homely, slighted trade.' It was in 1639, soon after his return from Italy, that Milton undertook the education and instruction of his sister's two sons, John and Edward Phillips, and from the younger of his two nephews is derived the little that we know directly of Milton's practice as a teacher. In 1640 he removed from a lodging in St. Bride's Churchyard to 'a pretty garden house in Aldersgate,' then almost a suburban quarter of London. Here in 1643 he received other pupils, 'the sons of some gentlemen that were his intimate friends,' so says Phillips, who wishes to present his uncle as an amateur, not a professional schoolmaster. Of the course of studies pursued we only know that it was multifarious and unremitting, even Sundays being fully occupied with divinity lessons. As far as numbers went Milton was a successful master; in 1645 he had to remove to a larger house in Barbican; but we do not

know that any of his pupils attained to eminence, and the after career of his two nephews must, as Mr. F. D. Maurice remarks, have been one of those bitter disappointments which attend the life of every great reformer. But it is with Milton as a theorist rather than as a practical schoolmaster that we are concerned; yet it is well to bear in mind that though his great tract on education seems purely utopian, yet it has a basis of personal experience, and the methods therein advocated had, in part at least, been tested in the schoolroom. The tractate *Of Education: to Master Samuel Hartlib*, was first published on June 5, 1644. It is described by the author as 'that voluntary idea which hath long in silence presented itself to me of a better education, in extent and comprehension far more large, and yet ofttimes far shorter and of attainment far more certain than hath been yet in practice.' Of such a well-known book an analysis would be superfluous, and it has been recently edited for the Pitt Press by Mr. O. Browning. All we can here attempt is to define Milton's historical position, and consider his claims to be numbered among educational reformers. In Milton's tractate we see the advance which even literary men nursed on the writings of Greece and Rome had made towards the study of nature. Unfortunately we have no English word answering to the German *Realismus*, so when we speak of 'real realism' and 'verbal realism,' we must explain our meaning. The scholars of the Renascence turned away from the material world to study first the style, then the thoughts, of the great writers of antiquity. But from Rabelais onwards there was a protest raised against this idolatry of the classics, and 'things, not words,' were proposed as the true subjects for teaching. But so accustomed was every one to turn to books for instruction, that the first realists were what the Germans call 'verbal realists,' i.e. they would teach indeed about things, but for this teaching they would use not the things themselves, but books about them. Milton shows a great advance on the classicists of his day in declaring that the learning of languages was in itself useless, and that the scholar might be inferior to the unlettered man who knew his mother tongue; but he hardly went so far as Rabelais in recommending the study of actual things, and he would use the ancient writings to give information which would have proved totally out of date and worthless. Thus he would incite and enable his pupils hereafter to improve the tillage of their country by the study of the great authors of agriculture, Cato, Varro, and Columella. For all that appears in the *Tractate*, the works of Bacon were to Milton a book with seven seals. And in the study of literature there is the same blind reverence for antiquity. Among the poets which will be read with care and pleasure are third-rate authors, such as Nicander, Oppian, Dionysius; but Chaucer, Spenser, and Shakespeare are ignored, and indeed the only modern authors recommended are those who write of the use of the globes. Judged from a modern point of view, the *Tractate* has another and even more radical defect. Its chief aim is the communication of knowledge, not the training of faculty. It inculcates omniscience, and there is not a hint of the desirability of specialisation, or the duty that is laid on every master to study and further the individual bent and inclination of his pupils. Milton's ideal pupil is equally ready to be prime minister, command the Channel fleet, and occupy the chair of poetry, rhetoric, or philosophy. Milton takes his own powers as the standard of human capacity, and would form men in his own image. With haughty self-reliance he formulates his own scheme of education, and sneers at *Modern Janua's and Didactics*, the two monumental works of his great contemporary which were revolutionising the art of teaching. In spite of these radical defects we shall not with Mr. Pattison pronounce the *Tractate* valueless as a contribution to educational theory, and of purely biographical interest. 1. Negatively, as a protest against the Public School Education of England, which still in a great measure survives, its influence has been great. It is the armoury whence our modern reformers—Farrar, Huxley, Seeley, Quick—have borrowed their keenest shafts. 2. Positively, it sets before the teacher a noble, if somewhat vague and shadowy ideal. Even Mr. Pattison allows that Milton's definition of education has never been improved upon: 'I call a complete and generous education that which fits a man to perform justly, skilfully, and magnanimously all the offices, both private and public, of peace and war.' 3. Although the intellectual curriculum he proposes is absurdly ambitious on the

one hand, and pedantically narrow on the other, as deriving all knowledge from the medium of books, yet Milton was the first of the moderns to insist on the co-ordination of physical, moral, mental, and æsthetic training. 'The best teachers of the present day may well have the same object at heart; and they need not be ashamed to learn from a man who may have made a thousand mistakes, but who nevertheless had a wisdom and a righteousness of purpose in him which the best and truest living will most delight to honour and to possess.' (From notes of an unpublished lecture by F. D. Maurice, delivered before the Royal Institution.)

Mind (Science of). *See* PSYCHOLOGY.

Mischievousness.—This term refers to the disposition to do harm rather from carelessness and wantonness than from any malicious motive. A large part of children's mischievousness springs out of their destructive propensities. That the love of destruction is a strong force in the young and in the untamed adult, is a fact of everyday observation. When the brutal instinct is clearly present in a boy's mischievous act, as when he breaks a thing in a fit of passion, the action is a proper subject for reprehension, and, if need be, for punishment. At the same time the moral educator must be careful to distinguish savage destruction from the more venial mischievousness which springs from mere exuberance of activity and high spirits. It is to be remembered, too, that a good deal of children's mischief-making is the outcome of curiosity and the natural impulse to experiment with things. As a quality whose moral gravity cannot safely be estimated by the amount of inconvenience it causes others, mischievousness requires very careful handling. No doubt the child must be trained to see the consequences of his wanton acts; but full allowance must be made for the absence of intention. Much the same line of remark applies too to that form of mischief which, though involving an intention to provoke, springs out of childish roguishness or a love of fun. A wise parent or teacher will often prefer to pass by such mischief altogether rather than run the risk of betraying personal annoyance by inflicting an excessive penalty. (*See* Locke, *Thoughts on Education*, § 116; also article 'Unart,' in Schmidt's *Encyclopädie*.)

Mixed Education.—The education of students of both sexes together. (*See* PROVINCIAL COLLEGES.)

Mixed Schools. *See* CLASSIFICATION.

Mnemonics (from Gr. *μνήμη*, memory) is the art of assisting the memory by definite rules. Various devices have been proposed in ancient and modern times for facilitating the retention and reproduction of what is learnt. These refer to verbal retention, as in learning off a speech, a series of names, &c. The underlying principle of the classical mnemonic system was the association of the consecutive heads of a verbal composition with the divisions of an extended surface or enclosed space, as the compartments of a building, so that when the eye or the imagination ran over these, the order of their arrangement in space would at once suggest the order in time of the words. It is now commonly recognised that these devices can have but a very limited value, and are likely to be a hindrance rather than a help in certain cases. In modern educational systems verse-form, rhyme, and alliteration, together with the investing of disconnected matter, e.g. list of exceptions to a grammatical rule, with the semblance of a connected meaning, have commonly been resorted to for the purpose of aiding the memory. The utility of presenting verbal material, such as the chief events of a reign, in a visible form by means of a diagram, is well known to every teacher. All such contrivances depend for their efficiency on the working of the Laws of Association, Contiguity, and Similarity, apart or in combination (*see* ASSOCIATION). It is indisputable that we all instinctively tend to shorten the process of memorising by a number of such ingenious devices, and these may properly be made use of by the teacher. At the same time, great care must be taken lest, by an excessive use of these, the learner lapse into a mechanical way of learning. It is a far better exercise for the mind, and for the memory too, to associate things to be learnt by their natural ties, rather than by artificial ones. And a truly scientific management and control of memory will consist in forming a habit of concentrating the mind on the subject matter to be learnt, of judiciously selecting important points, and arranging the whole with reference to these, and finally of making the fullest use of the laws of association in linking part with part, and the whole with what is already known. (*See*

D. Stewart. *Els. of the Phil. of the Human Mind*, chap. vi. § 7; Sully, *Teacher's Handbook*, p. 203, &c.; and *Encycl. Brit.*, art. 'Mnemonics.')

Moderations ('Mods').—The public examination at Oxford before the masters of the schools, which has to be passed by successful candidates for the Bachelor's degree between responsions or 'smalls' (which corresponds to the Cambridge Previous Examination, or 'Little Go') and the second public examination before the public examiners.

Modern Languages.—Modern or living languages are so named in opposition to ancient and dead languages, the most important of which from a scholastic point of view are the so-called classical languages of ancient Greece and Rome—the Greek (*q.v.*) and Latin (*q.v.*)—and the Hebrew, in which the Old Testament or religious literature of the ancient Israelites is written. The intrinsic value of a living language and its educational importance may be determined by the following tests: (1) whether it is the key to a great literature, (2) whether it is spoken by a numerous more or less civilised population, and is therefore useful for the purposes of commerce and industry, or diplomacy. The modern tongues answering these tests are very few as compared with the total number of living languages. They are divisible into two great sections, (1) the Western or Occidental, and (2) the Eastern or Oriental languages. Of the latter section, including Arabic, Turkish, Persian, Chinese, Japanese, and the languages of Hindostan (Hindostani, Bengali, Hindi, Telugu, Tamil, Burmese, &c.), nothing further requires to be said in this place, as their study is not comprised within the ordinary curriculum of elementary or secondary English schools. The Occidental languages comprise the languages of the nations of modern Europe and their numerous colonies in North and South America, Africa, and Australia. Of these the most important are:—

I. The Teutonic Family (daughters of the Gothic):
- (*a*) English.
- (*b*) German.
- (*c*) Danish and Norwegian.
- (*d*) Swedish.
- (*e*) Dutch, Flemish, Frisian, &c.

II. The Græco-Romanic Family (daughters of the Latin and Greek):
- (*a*) French.
- (*b*) Italian.
- (*c*) Spanish.
- (*d*) Portuguese.
- (*e*) Roumanian.
- (*f*) Modern Greek.

III. The Slavonic Family:
- (*a*) Russian.
- (*b*) Ruthenian or Little Russian.
- (*c*) Polish.
- (*d*) Czech.
- (*e*) Serbian.
- (*f*) Bulgarian, Slovenian, &c.

In addition to the preceding, the modern European tongues include:

IV. The Celtic Family:
- (*a*) Welsh.
- (*b*) Gaelic.
- (*c*) Erse.
- (*d*) Manx.
- (*e*) Armorican.

V. The Lithuanian and Lettish.

VI. The Albanian, spoken by the Arnauts in the centre of the Balkan Peninsula.

The foregoing six groups represent the modern European section of the great family of languages known as the Aryan or Indo-European.

Of non-Aryan tongues there are spoken in Europe: the Finnish, Hungarian, and Esthonian, belonging to the Altai-Ugrian Family; the Turkish; the unclassifiable Basque, the ancient language spoken in Northern Spain and the neighbouring districts of South-Western France; the language of the Laplanders, and some other dialects of minor importance.

Of all the living languages of Europe there are only six that can on various grounds claim to be regarded as of unquestionably first-rate importance, to wit, English, French, German, Italian, Spanish, and Russian. Five of them are politically important as the native tongues and State-languages of the five great Powers. All are commercially important as the languages spoken by races numbering from thirty to forty millions in the case of Italian and Spanish, about forty-five millions in the case of French, sixty millions in the case of German (including the Germans of Austria and Switzerland) and Russian, and one hundred millions in the case of English (including the United Kingdom, the United States, and other Anglo-Saxon

colonies). In these languages, too, almost all that is valuable in modern literature is written, and each contains a special and valuable literature of its own. In the conventional phraseology of the scholastic profession in England, however, the term 'modern languages' is generally used in a still more restricted sense, and is understood to mean, not the mother tongue, but only two, or at the most three, *foreign* living languages, namely, French, German, and Italian.

French, German, and Italian.—Leaving, therefore, the English language, which is dealt with in a separate article (*q.v.*), we shall proceed to deal with the chief foreign living languages usually taught in English schools.

The possession of a competent knowledge of a foreign living language—the ability, we mean, to speak, to read, to write it, and to translate it accurately, within the limits of ordinary non-technical discourse—is an accomplishment of high and often indispensable value, whether for the purposes of commerce, of literary and artistic culture, of travel and international intercourse, or of diplomacy and other professional pursuits. This fact is now so universally acknowledged that it would be unnecessary, even if our space permitted, to attempt to prove it in detail. The disadvantages of a total ignorance of foreign languages are keenly felt from the moment one steps on foreign soil to the moment one leaves it. The advantages of linguistic attainments, on the other hand, are every day illustrated by the increasing employment of foreigners, to the detriment of Englishmen, in all our great commercial centres, and in all positions in which a knowledge of a foreign language (French, German, Spanish, or Russian) is indispensable. The notion that foreigners have a talent for the acquisition of foreign tongues not possessed by Englishmen is, we may parenthetically observe, a pure hallucination. The class of foreigners who best succeed in the way above mentioned in England are Germans, and it is only because (1) the Germans in their own country devote to the grammatical and oral study of tongues not their own, years of dogged, persistent labour, and because (2) the methods of teaching in German schools are superior, that Germans become more accomplished linguists than Englishmen. No doubt the want of success of young Englishmen in this branch of knowledge is in no small degree attributable to the repeated disappointments and false notions arising from the promises of charlatan professors who undertake to teach a foreign language in 'twelve easy lessons of an hour each.' But how any rational English student, who, however old he may be, is aware that he does not yet even know his own language perfectly, can be deceived by such impostures it is difficult to understand. Not only in commerce are linguistic attainments of very material value, but in diplomacy, and some other professions connected with literature, science, and the arts, a knowledge of one or more foreign living language is the *conditio sine quâ non*, the indispensable qualification for admission to the most distinguished and lucrative positions.

The value of the study of language as a mental discipline has been highly esteemed in all ages, and indeed cannot be over-estimated, except when it is permitted to exclude all other subjects of study, or to prevent a due share of attention being devoted to the mathematical and physical sciences. Hitherto in England this training has been sought almost exclusively in the study of the classical or dead languages—a choice justified by the fact that those tongues are the repository of the laws and literature, the history and the philosophy, of the two great peoples who laid the foundations of European civilisation, and further by the fact that those tongues are the parents of all the Romance languages, and have supplied all the modern Western languages with almost all their vocabularies of art, science, politics, and philosophy. It is now generally admitted, however, that the attention devoted to Latin and Greek in the leading English public schools is excessive. The classics, in fact, have been allowed to monopolise an amount of time and labour out of all proportion, not only to their educational value, but to the period spent at school, to the ordinary length of human life, and even to the value of their literatures for the purposes of purely liberal culture.

The educational value of linguistic study depends very largely on the correctness of the method of teaching, and in this point living languages have in England always had an advantage over those of antiquity. Modern languages are far more generally taught in a natural and rational manner than the dead tongues, and their

utility, when properly taught, as a means of training pupils to think and to employ words with accuracy in the expression of thought is, in the opinion of some authorities, in no way inferior to Greek and Latin.

French.—By reason of its prevailing clearness in point of grammatical construction and logical analysis, and of the treasures of its literature, the French language, when rationally taught, is capable of being made a very effective instrument for training the mental faculties of the student. On somewhat different grounds this may also be affirmed of German and Italian. For English youth the study of French is not only an indispensable part of a really liberal education, (1) because since the Norman Conquest the histories of England and France are so intimately connected with each other; (2) because the French language has exercised so profound an influence in modifying the English tongue, both in its grammatical, and especially in its lexicological elements; and (3) because the two nations, owing to their proximity to one another, are brought into closer and more constant intercourse, and exercise a more potent influence on one another by the exchange of ideas, as well as of commodities, than any other two independent nations in Europe. The characteristic style and spirit of the French form a strong recommendation to its study. No other tongue, ever spoken or written, is clearer or more logical in construction, or presents such a perfection or finish in style; nor is there any other language whose analytical and synthetical study is more beneficial as a training in the accurate expression of thought. In this respect French is much preferable to German, as writers in the latter language, though often more profound, are seldom so perspicuous as the French. The French is, moreover, the easiest foreign language for an Englishman to learn. It has given to the English tongue so many of its words, and of its formative or word-building elements, that a large portion of French grammatical forms and vocables are already familiar to English beginners. It is true that France and the French owe their name to the German conquerors of old Gaul, the Franks; but though the language contains a number of traces of the speech of this Teutonic tribe, yet it is marvellous how small is the proportion of words and forms thus derived. Of the old Celtic language of Gallia the proportion existing in modern French is still smaller, hardly more than of the old British in modern English. Both in its vocabulary and in its grammatical forms French is a daughter of the Latin, with, however, a considerable addition of words, chiefly scientific and philosophical, coming from the Greek. As to the history of the French language, it arose out of the *lingua Romana rustica*, the dialect of Latin spoken in Gaul, where in the tenth century it finally prevailed over the language of the ruling Frankish race; but chiefly by the modifications they introduced French became distinguished as the *lingua francica* or *francisca*, otherwise the *langue d'oïl* (*oui*), both from the Provençal, the *langue d'oc*, and from the Italian, the *langue de si*. The *langue d'oïl*, the dialect of Northern France, became the language of the law, of the court, and of literature, under Francis I., who reigned from A.D. 1494 to 1547. The Provençal, or *langue d'oc*, is still the spoken dialect of Southern France. On the decline of Latin, as the medium of intercourse between scholars of different nations, French began to take its place, and in the department of diplomacy, and for the purposes of travel and international intercourse, French has for the past two centuries held undisputed pre-eminence. It has in fact been, and still is, employed as the quasi-universal language of the polite and educated classes of all European nations.

German.—In spite of the fact that German and English are far more closely related to each other than either to French, the first mentioned tongue is found less easy of acquisition than the last by English students. This is partly due to the retention of the old 'Black Letter,' the so-called German characters. Almost all other civilised peoples have long abandoned that variety of type for the far more legible and elegant Roman alphabet. The greatest German scholars, like the Brothers Grimm, long advocated in vain the entire abandonment of the former in favour of the latter. Fortunately this reform is gradually being introduced in modern scientific works, but the movement generally is making but slow progress, although all German children are taught both alphabets at school. Another more serious difficulty the German presents to English learners is the elaborate inflexional deve-

lopment and the complicated grammatical structure of the language. In the matter of style ordinary German compares most unfavourably with French. The one fault which is not forgiven in a French writer is inelegance and want of clearness of expression. The one virtue of a German writer is to be, or at least to appear, profound. A German who writes anything approaching to a clear and easy style is apt by his fellow-countrymen to be deemed a charlatan. The effect of these perverted notions is that in no other modern language is there so much slovenly writing. Germany has within the past century produced a larger number of profound scholars—men of deeper research in every department of literature and science—than any other country of the world; but German scholars habitually neglect the study of style, and the consequence is that while the press of Germany year by year turns out double or treble as many publications as either England or France, there are relatively far fewer additions to permanent literature—fewer works that will live—produced by German than by contemporary French and English writers. German works are, accordingly, more generally valuable for their substance, French for their style, and hence it would be difficult to over-estimate the value of the study of French as a supplement and corrective to that of German.

Methods of Teaching.—The ease and rapidity with which a language may be acquired, and the value of the study as a discipline of the mental faculties, depend mainly if not exclusively on the correctness of the method of teaching. There is proverbially no royal road to learning, or in other words no sound progress can be made in any department of knowledge without steady application, without sustained concentration of attention, without resolute devotion—in a word, without hard mental labour. But there is a right way as well as a wrong way in going about the work of learning a foreign tongue, and a given amount of mental effort under a correct method of teaching will produce incomparably superior results to many times the labour under a perverse method. In the teaching of languages the correct method is indicated by the nature of the subject. All speech is something essentially oral, and no language, living or dead, can be soundly or profitably taught, especially to beginners, where this fundamental characteristic is ignored. At the outset a language should always be taught by word of mouth. The pupils should learn first to recognise simple names or short sentences by ear; secondly, to repeat the same with their own tongue, and not till then should they be taught to write them down, to spell, and to read them. The correct mode of teaching languages is by what is called the inductive method. It proceeds from particular instances to general rules, and not till the student has gathered the rules for himself from concrete examples, should he proceed to apply them deductively or synthetically in forming new examples. The vice of the old style of teaching the dead languages arises from the fact that the first half of this process is either wholly or partially omitted, and the pupil is hurried on to the second half without the indispensable real knowledge that cannot be gathered otherwise than by going thoroughly through the former process. Oral teaching, familiarising the ear, the tongue, the eye, and the hand with each individual word, and every separate model in words and sentences, is the indispensable foundation of sound teaching in this department of education. The rules of accidence as well as of syntax are to be gathered by the pupil one by one from the comparison of a sufficient selection of model words and sentences, and in each case he must be required to use the knowledge he has thus gained by its deductive application in the formation of fresh examples without further aid. Thus introduced to the study, the pupil will find the work attractive, and he will make sound and rapid progress; while under the vicious system too frequently in vogue with Latin and Greek, the labour becomes repulsive, and he wastes the best years of his youth without making a tithe of the progress he would have done under the natural and rational method of instruction above indicated. Wherever any progress, in fact, has been made in the pædagogic art, it will be found that as regards the teaching of languages, native or foreign, the improvement is in principle always reducible to the introduction of the inductive method, or its application in some improved form—the system of rising from particular cases to general rules at once followed up with the deductive employment of the rules in oral and written exercises.

With regard to the teachers who have been successful in the department of foreign tongues, the names of Hamilton, Ollendorff, Ahn, and others may be mentioned as owing their success to the adoption, though but in a more or less incomplete form, of the inductive method. The manuals of Mr. Prendergast, the so-called *Mastery Series*, may also be mentioned as very efficient introductions to the several languages to which the system has been applied. The various German schoolbooks of Herr Karl J. Plötz, which are also mainly founded on the correct method, likewise deserve the attention of English teachers, as amongst the most successful of their class in Germany during the past generation. Dr. Otto's grammars, and the *Toussaint-Langenscheidt* series will also be found among the best recent manuals published in Germany. *See* articles PRENDERGAST, PARALLEL GRAMMARS, and Mr. Colbeck's *Lectures on the Teaching of Modern Languages*.

Modern Schools, or Sides.—Modern sides may practically be considered to have originated in Dr. Arnold's opening the doors of Rugby (somewhere about the year 1830) to the subjects of modern history and geography, modern languages, and mathematics, which had long clamoured for admission into the curricula of public schools. It is true that Dr. Arnold set no very great store by these subjects; but, nevertheless, under his rule they obtained a recognised footing on the list of studies. Since his time, the public demand for 'modern' subjects has continually increased; and in the Endowed Schools Commission Report of 1868, received a still more authoritative sanction. In that report the Commissioners recommend that in schools of the *First Grade* (i.e. classical schools) opportunity should be given for the advanced study of modern languages, and mathematics, or science. The introduction of these 'modern' subjects into most, if not all, of our public schools has rendered the organisation of modern sides or schools necessary. As a rule, the modern side is distinct from the classical side as far as regards school-work. The boys on the modern side do no Greek, and somewhat less Latin than those on the classical side. They also learn French, German, mathematics, and generally some physical science (usually chemistry), a little history (usually of Greece and Rome), sometimes a little geography, and occasionally a little English literature. Up till quite lately, no boy of any marked ability had much chance of being allowed to go on to the modern side, that side being reserved for the incapable and backward. But since the universities of Oxford and Cambridge have more distinctly recognised 'modern' subjects, it is not wholly improbable that the Public Schools (*q.v.*) will before long treat these subjects with greater respect. The subjects taught on a 'modern side' are almost exactly those recommended by the Report of 1868 for *second-grade* schools (see *Mid.-class Schools*). Occasionally *second-grade* schools organised on the lines of this report are termed 'modern schools.'

'Mods.' *See* MODERATIONS.

Monastic Schools. *See* MIDDLE AGES (SCHOOLS OF THE).

Monitorial System.—The rival pretensions of Lancaster and Bell to the honour of discovering the monitorial system occupied a very large share of public attention, and provoked a controversy which was carried on with much bitterness. Had, however, Lancaster and Bell been students of the literature of pedagogy they would have known that the discovery on which they prided themselves was already more than a hundred and fifty years old. In a work so well known as the *Didactica Magna*, Comenius distinctly advocates the division of a school into classes of ten (which he calls *decuriae*) and the putting of each class under one of the best boys (whom he calls a *decurio*). Still, though Dr. Bell (*b.* at St. Andrews, 1753) was not the first to discover a monitorial system, he undoubtedly did adopt such a system, during his superintendence of the Military Orphan Asylum at Madras. Hence his system is sometimes called the Madras system. In 1797 he published an account of it. It was the unwillingness of adult teachers to carry out his wishes that led Bell to employ boy teachers. Southey tells how the idea first occurred to him. 'Happening on one of his morning rides to pass by a Malabar school he observed the children seated on the ground, and writing with their fingers in sand which had for the purpose been strewn before them. He hastened home repeating to himself as he went Εὕρηκα, "I have discovered it," and gave immediate orders to the usher of the lowest class to teach the alphabet in the same manner, with this

difference only from the Malabar mode, that the sand was strewn upon a board. These orders were either disregarded, or so carelessly executed as if they were thought not worth regarding; and after frequent admonitions and repeated trials made without either expectation or wish of succeeding, the usher at last declared that it was impossible to teach the boys in that way. If he had acted on this occasion in good will, and with merely common ability, Dr. Bell might never have cried Εὕρηκα a second time. But he was not a man to be turned from his purpose by the obstinacy of others, nor to be baffled in it by their incapacity; baffled, however, he was now sensible that he must be if he depended for the execution of his plans on the will and ability of those over whose minds he had no command. He bethought himself of employing a boy on whose obedience, disposition, and cleverness he could rely, and giving him charge of the alphabet class. The lad's name was John Frisken; he was then about eight years old. Dr. Bell laid the strongest injunction upon him to follow his instructions, saying he should look to him for the success of the simple and easy method which was to be pursued and hold him responsible for it. What the usher had pronounced to be impossible this lad succeeded in effecting without any difficulty. The alphabet was now as much better taught as till then it had been worse than any other part of the boys' studies, and Frisken, in consequence, was appointed permanent teacher of the class. Though Dr. Bell did not immediately perceive the whole importance of this successful experiment, he proceeded in the course into which he had been, as it were, compelled. . . .Accordingly, he appointed boys as assistant-teachers to some of the lower classes, giving, however, to Frisken the charge of superintending both the assistants and their classes. . . .The same improvement was now manifested in these classes as had taken place in teaching the alphabet. . . .Even in this stage he felt confident that nothing more was wanting to bring the school into such a state as he had always proposed to himself, than to carry through the whole of the plan upon which he was now proceeding. And this, accordingly, was done. The experiment which, from necessity, had been tried at first with one class was systematically extended to all the others in progression. . . As to any purposes of instruction the master and ushers were now virtually superseded.' (*See* Southey's *Life of Bell*, i. 173.)

Lancaster (*b.* Kent St., Southwark, 1778) began to make use of monitors about 1800, and in 1803 he published an account of his plan. He did not deny that Bell had anticipated him, but he claimed, nevertheless, the credit of being a discoverer, in that he had employed monitors before he had ever heard of Bell or of his work. Speaking of the doctor's pamphlet, he remarks: 'From this tract I got several useful hints. I beg leave to recommend it to the attentive perusal of the friends of education and youth. I much regret that I was not acquainted with the beauty of his system till somewhat advanced in my plan; if I had known it, it would have spared me much trouble and some retrograde movements.' Lancaster, in his first letter to Bell—a letter asking for counsel and help—says: 'In puzzling myself what to do, I stumbled on a plan similar to thine,' and the doctor, in a perfectly friendly reply, did not dispute the claim.

The distinguishing features of Lancaster's plan are, to quote his own words: 1. 'That by his system of order and rewards, together with the division of the school into classes, and the assistance of monitors, one master is able to conduct a school of one thousand children.' 2. 'That by printing a spelling book or any other lessons for reading in a large type. . . .they may, when suspended with a nail against the wall, be read by a number of children, a method whereby one book will serve for a whole school. 3. The introduction of slates and dictation, 'a method whereby five hundred boys may spell and write the same word at the same instant of time.' 4. 'An entire new method of instruction in arithmetic, whereby any child who can read may teach arithmetic with the utmost certainty.' 5. 'Cheapness—seven shillings a year for each child in a school of three hundred, and four shillings a child for a greater number.' The system, whether of Bell or of Lancaster, was built on the assumption that a child who knows nothing of the art of teaching, and next to nothing of the subject to be taught, can be an efficient instructor, and it was, besides, weak in a hundred details. Yet it was of real service to the cause of education, for it made schools very cheap. Urged

by the British and Foreign School Society and the National Society, benevolent persons all over the country established and maintained schools which it would have been impossible to establish or maintain at the present rate of expenditure. Furthermore, when the State resolved to subsidise elementary education, these schools were ready to receive aid at once, and could thus be brought into a satisfactory condition sooner than new schools. We should also remember that monitors developed easily into pupil-teachers, and that the pupil-teacher system has produced the most skilful body of instructors the country possesses. (See *Brief Sketch of the Life of Joseph Lancaster*, by William Corston, London, 1840; *Improvements in Education*, by Joseph Lancaster, London, 1803; *Outlines of a Plan for Educating Ten Thousand Poor Children*, by Joseph Lancaster, London, 1806; *A Comparative View of the Plans of Dr. Bell and Mr. Lancaster*, by Joseph Fox, London, 1808.)

Montaigne, Michel Eyquem de (1533–1592), the essayist, lived in what Milton calls 'the scholastic grossness of barbarous ages,' 'ragged notions and babblements,' and when the Humanistic movement among the leaders of thought in Europe began to tell upon the education of youth. His father, a gentleman of private estate in the province of Guienne (of English descent), had notions of his own as to the education of youth, and Montaigne's own views on the education of the young are very much a reflex of his own experience and character. Put in the shortest form, Montaigne's idea of the end of education is, that a man should be trained up to the use of his own reason. 'A man can never be wise save by *his own* wisdom.' The end of education must ever be kept in view, and that end is to train to right reason and independent judgment, to moderation of mind, and to virtue. Montaigne's educated man is the cultivated and capable man of affairs, capable of managing his own business well, and of discharging public duties wisely. 'The most difficult and most important of all human arts is education,' he says. Lessons of philosophy in their simple and practical form are to be inculcated from the very first. Ethical training, consisting of virtue and wisdom, is the main purpose of education. The ordinary subjects of reading, writing, and casting accounts are to be taught, of course. After this, whatever you teach, avoid words simply as words. 'The world is nothing but babble. . We are kept four or five years to learn nothing but words and to tack them together into clauses; as many more to make exercises, and to divide a continued discourse into so many parts; and other five years at least to learn succinctly to mix and interweave them after a subtle and intricate manner. Let us leave this to the learned professors!' Vernacular and modern languages must be taught. Then 'the pupil may be admitted to the elements of geometry, rhetoric, logic, and physics; and then the exercises which his judgment most affects he will generally make his own.' History should not be neglected. Besides moral and intellectual instruction, there should also be physical instruction; for, ''tis not a soul, 'tis not a body we are training only, but a man, and we ought not to divide him.' Effeminacy in food and clothes, or habits, ought to be eschewed. All instruction must be essentially ethical and humanistic. It should be added that, like Milton and Locke, Montaigne thinks only of the education of the sons of gentlemen. The best editions of Montaigne's works are those of Coste (3 vols. 4to., London, Tonson, 1724) and of Le Clere (5 vols. 8vo., Paris, 1826–28).

Moral Education.—This forms one of the main divisions of mental culture (*see* EDUCATION, THEORY OF). It includes the proper development of the active powers and the will, together with the feelings so far as they are involved in volition, with the view of rendering the individual an efficient and good citizen. Such a result can only be obtained by the formation of independent moral habits, which again involve fixed internal dispositions towards what is right, or what Kant calls a good will. This building up of good habits and a moral character necessarily begins with the exercise of authority and the enforcement of discipline. A habit of obedience is the first element of character. This discipline must, however, be followed by a training of the will to a free and intelligent submission to the requirements of the moral law. Moral education is the crowning phase of all education (*see* article KANT). It includes at once the training of the intellect to clear discernment, the exercise of the feelings in worthy forms of manifestation, and the stimulating of the will to right action.

Of the agencies to be employed here, moral instruction through concrete examples drawn from real life and from books counts as an important one. A large influence must be assigned to the educator's own moral example, which works through the impulse of imitation. Finally the moral educator, whether parent or teacher, must recognise the powerful influence of companions in forming the moral character, and control these so far as possible with a view to the furtherance of moral education. Cf. articles DISCIPLINE and OBEDIENCE. (On the ends of moral education *see* Mrs. Bryant, *Educational Ends*, pt. i.; on the methods of moral instruction *see* Locke, *Thoughts*, § 32 following; Miss Edgeworth, *Practical Education*, chap. vi.–xi.; H. Spencer, *Education*, chap. iii.; Dr. Bain, *Education as Science*, chap. xii.; and Compayré, *Cours de Pédagogie*, lec. 2.)

Moral Sense.—This is the name commonly given to the faculty which we exercise when we approve what is morally right, disapprove what is morally wrong. It involves at once a capacity of feeling pleased or pained, and of judging as to the quality of the action which pleases or pains. When occupied with the subject's own actions or dispositions the faculty is spoken of as *conscience*. Conscience is thus the moral sense turned inwards in the act of reflection. The question has been much discussed in modern ethics whether the moral sense is innate or a product of external circumstances and education. The truth probably embraces both of these opposing views. All normally constituted children have by nature dispositions such as trustfulness, deference, a love of approbation, and more generally what we call the social feelings, which favour the growth of the moral sentiment. It is possible, too, as the evolutionist maintains, that many generations of moral culture have resulted in the formation of a more definite inherited bent to feel and think morally. At the same time it is incontestable that external aids are necessary to develop this crude germ into the mature and competent faculty. These external aids consist of appropriate social surroundings, the effect of moral example, and all that is comprised under moral education (which *see*). (On the different views of the moral sense, *see* Bain, *Mental and Moral Science*, Ethics; Sidgwick, *Methods of Ethics*; on the education of the Moral Faculty, *see* Sully, *Teacher's Handbook*, p. 424 and following; Waitz, *Allgemeine Pädagogik*, § 14; Pfisterer, *Pädagog. Psychologie*, § 16).

More, Sir Thomas (*b.* 1480, *d.* 1535), the celebrated Chancellor, relates in his *Utopia* (1518) that 'both men and women are taught to spend those hours in which they are not obliged to work in reading, and this they do through the whole progress of life,' and in his instructions for the education of his children he advocated the theory that girls should be taught the same subjects, and be afforded the same educational facilities, as the boys.

Mulcaster, Richard (1530 ?–1611), was the first head-master of Merchant Taylors' School, founded in 1561. He was born of a good county family of Cumberland, probably at the old border town of Brackenhill Castle, on the river Line. He was educated at Eton and at King's College, Cambridge, whence he migrated to Oxford, and was elected student of Christ Church in 1555. After distinguishing himself at Oxford by his knowledge of Hebrew and Eastern literature he became a schoolmaster in London in 1558. Three years later, as has been said, he was appointed head-master of Merchant Taylors' School at Laurence Pountney Hill, between Cannon Street and the river. It may be mentioned here that Edmund Spenser was one of his pupils, and it is said that amongst other pupils he numbered nine of King James's translators of the Bible. In 1581 he published his *Positions for the Training up of Children, either for Skill in their Booke or Health in their Bodie*, and in the next year his *Elementarie*, or first steps in education. In the former he sketches a really excellent all-round education for body and mind, and anticipates many of the newest ideas of our own day. The 'natural abilities of children, whereby they become either fit or unfit to this or that kind of life,' are to be considered. He lays great stress—for the first time in England—on the mother tongue and the ability to read, write, and spell it in advance of, and, if necessary, to the exclusion of Latin. 'As cosen germain to faire writing is the ability to draw with pen or pencil,' and this should be taught, 'while the finger is flexible'—another anticipation of the views of our day. 'It is good,' he stoutly asserts, 'to

have every part of the body and every power of the soul fined (or polished) to the best.' He would have every child taught music by voice and instrument, as he taught them at his own school. The younger the boy the more skilled his master should be: 'the first grounds should be laid by the cunningest workman.' He insists that 'young maidens are to be set to learning, which is proved by the custom of our country, by our duty towards them, by their natural ability, and by the worthy effects of such as have been well trained.' The book is dedicated to Queen Elizabeth. He deplores 'the incurable infirmities which posting haste maketh in the whole course of study,' and points out 'how necessary a thing sufficient time is for a scholar.' He ends up with a vigorous plea for the training of all schoolmasters. These are but a few of the most striking points of a book well worth study. It has lately been reprinted by Mr. Quick. The *Elementarie*—only the first part of which has ever been published—is most notable for its splendidly eloquent plea in behalf of the study and use of English. We have only space for a very short quotation. 'Is it not a marvellous bondage to become servants to one tongue, for learning's sake, the most part of our time, with loss of most time; whereas we may have the very same treasure in our own tongue with gain of most time? Our own bearing the joyful title of our liberty and freedom, and the Latin tongue remembering us of our thraldom and bondage? I love Rome, but London better; I favour Italy, but England more; I honour the Latin, but I worship the English. . . . But why not all [our learning] in English, a tongue in itself both deep in conceit and frank in delivery? I do not think that any language, be it whatsoever, is better able to utter all arguments either with more pith or greater plainness than our English tongue is.' We need not wonder at such enthusiasm in one who was Spenser's headmaster, and not improbably the friend of Shakespeare.

Mulcaster resigned the head-mastership of Merchant Taylors' School in 1586. Ten years later he was high master of St. Paul's School. In 1598 the Queen made him rector of Stanford Rivers in Essex, but he does not seem to have taken up his residence there till 1608. He died in 1611. For further particulars see the Appendix to Quick's reprint of the *Positions*; *Gentleman's Magazine*, vol. lxx.; and Fuller's *Worthies*.

Multum non Multa.—It is somewhat difficult to state with certainty who was the first to give vent to this maxim. From the time of Socrates and Plato to our own days almost every writer on education has urged, in one form or another, that the true test of learning is that a man should know *much* rather than *many things*, while some go so far as to assert that it is *practically* of greater use to know much of one or two subjects than to be generally informed about many; though Montaigne, by the way, makes an exactly opposite assertion, in which in the main he is followed by Locke. It is to be remembered, however, that neither Montaigne nor Locke wishes to produce *learned* men. Three writers have pushed things to a paradox: Rabelais desiring both many things and much; Rousseau desiring neither much nor many things; and Jacotot asserting that we should learn one thing well and derive all other knowledge from it, or, at any rate, connect all other knowledge with it. Bacon, and still more Comenius, dreamed of a knowledge which, for the learned few, should include all things knowable; but when they treat of education, Bacon recommends the narrow but thorough system of the Jesuits; and Comenius applies this very maxim to every one of his chosen school subjects. Indeed there is an immense consensus of opinion that true learning for the normal human being consists in knowing one, or at most two, subjects thoroughly. The question still undecided, and on which a great variety of shades of opinion have existed and still exist, is whether the maxim, 'much not many things,' should be applied to school work, and if so with what modifications and restrictions. If the question were really whether (as some put it) the aim of our schools should be to produce *learned* men or *able* men fitted (to use Herbert Spencer's phrase) for 'complete living,' the vast majority would vote with Montaigne, Locke, and Rousseau for the '*able* man,' leaving the specialists for a separate consideration. But it is not a question simply between the storing of knowledge and the training of faculty; for, as every teacher of experience knows, there is a clear limit to the variety of sub-

jects beyond which the faculties gain no valuable or efficient exercise, but are rather confused and baffled. It is precisely in a case of this kind that psychology (or mental science) is of inestimable value. The answer it gives seems to be as follows: Provide fully for the adequate exercise of every faculty, using for means of exercise that knowledge in preference which the pupil will need in his after life, and remembering that for each faculty some variety of subject is of great value. Be thoroughly sound in everything; but deal rather with those properties and laws of a subject which have the widest and most ready application, attending more to its larger features than to a multiplicity of minor points. Leave all specialisation to the later years of school life, or still better to the university period. As far as may be, render it possible for every pupil to specialise hereafter; not in *one* direction only, but in *any* direction which his life may come to need. Fit him to acquire new knowledge and to be able to use it.

Museums. *See* SCIENCE AND ART MUSEUMS.

Music among the Greeks held a most honoured post in the general educational system. This was due largely to Pythagoras, who (Iamblichos tells the tradition) came to the Greek cities of Italy from his native Samos, after having studied music and numbers in Babylon for twelve years. He, the most beautiful man in soul and body of his time, and with limitless power over his disciples, preached to them the gospel of moral purification through the senses—the exact antithesis to the later Christian code of moral purification in spite of the senses. And thus, teaching about a century before Sokrates, and while Tarquin the Proud reigned as the last of the ancient kings of Rome (that is *circa* 525 B.C.), he laid it down to the men of Crotona, and it became a law for all Greek culture, that of all the senses the sense of hearing was the chief moral agent. For beautiful sounds, he said, are more subtle in their nature, more variable, more constantly at hand, in every musical instrument, than are beautiful sights. Music he regarded as the finest source of beauty, and his object in training was to fill the soul with beauty. He disapproved of the flute as too sensuous, and chose the sterner lyre as his chief instrument. Melodies he composed, and caused to be composed, to cope with every mood, to assuage grief, to curb desire, to banish fear. Fine passages from the poets he set to music, so that noble ideas as well as noble emotional states should pass readily among the people. He relied strongly upon grave rhythms to steady character, and he always played somewhat on the lyre, on awakening, to clear his brain; and before sleeping, to purge his mind of the distractions of the day, and clear the troubled waters of the soul. He even went so far as to condemn his intimate disciples to a five years' probationary silence, not only to test their endurance by preventing them from speaking, but to ensure their receptivity for the beautiful sounds which he took care to pour into their ear. The order or brotherhood he thus founded lasted till the downfall of ancient republican Greece, and Epameinondas himself, last of the free heroes, was a member of it. This body, more powerful over education and culture in its day than have been the Jesuits in ours, reposed, as we have seen, chiefly upon music as the basis of its teaching.

From musical melody Pythagoras taught the power of order, since all sound is orderly vibration as against irregular noise, and order is shown in daily life as organised labour; next came harmony, which in souls is seen as friendship or love; thirdly rhythm, which in daily studies appears in the sciences of number and in those bodily exercises which the Greeks held so essential to a finely educated man; in fact, music thus led up to grace and strength through its rhythm, as it led up to beauty through its melody, and to love through its harmony. Thus the Pythagoreans, trained to strength, beauty, and love, formed a community whose renown even now fills our ears, and whose fame was co-extensive with Greek culture. On all hands they were admitted to surpass their contemporaries in moral excellence and in intellectual attainments. They were the flower of Greek culture. So great educational value has never been since drawn from music. Even in detail the Greeks (for we may regard what has been said of Pythagoras as applying practically to all the Greeks, and even including stern Sparta herself) credited music with the power to train a man in *tact* and in *savoir faire*, by training his physical touch (*tactus*) and his power of harmonis-

ing sounds, for these faculties would, they taught, give him social touch and social harmonising power. When we consider that musical scales and ratios, including the theory of the vibrations of stretched strings and of pipes, were discovered by these men, that the atomic theory, the revolution and rotation of the earth, were secrets known to them, that Aristaiôn, Nikomachos, Philolaos, and, above all, Empedoklês, were only some few of them, we are astounded at what was done by an avowedly musical education. Even Plato declares without reservation in his *Republic* that to a perfect education there are but two absolute essentials, gymnastic for the body, music for the mind, and to a Greek, as we have already seen, gymnastic is a branch of music (*mousikê*). In Plato's time, and for long before, the Greek boy of the noble classes spent nearly all his time in these two studies, as any one may verify by referring to the sketch of a Greek boy's day in Lucian's *Erotics*.

One must further remember that the Greek tragedies, flower of a superb literature, were in musical recitative throughout the dialogue, and in formal melody (possibly harmonised, but of this we are not sure) as regards the choruses; so firmly persuaded were the Greeks of the necessity of music if the mind had to be strongly aroused. With a chorus of fifty, Aischulos (Æschylus) produced such terror that ever afterwards fifteen only was the largest number the law allowed to a dramatist.

The Romans stole their music, as they did all their other arts, from the Greeks, and, with the usual fate of exotics, music therefore proved meaningless to them. They made no use of it, never even tried to appreciate its worth. A trumpet-call was the sweetest sound to a man of the republic, lascivious flute-music lulled the voluptuaries of the empire. How great a contrast alike in the rugged coarseness and the effeminate debauchery to the elegance and completeness of the Greek ideal! And, according to the universal testimony of the Greeks, their finely balanced character reposed on the influence of music.

At the downfall of Rome music divided sharply into two courses, the one half taking service with the church, the other half with lay folk. The influence of church music on education was of course very small; to learn the ecclesiastical chants was part of a priest's professional work, and had its religious value, and no other, upon the people at large. With secular music it was otherwise.

The troubadours or knightly minstrels of Southern France and the trouvères of Northern France turned music, during the eleventh to the thirteenth centuries, into an important element of courtly education. With his attendant jongleur or accompanist (who no doubt often supplied the practical corrections which the work of the noble amateur even of the present day occasionally cries out for), the troubadour passed from court to court, diffusing almost the only real refinement known to that rough age. Under the power of poetry, enhanced by music, chivalrous thoughts sprang up, just as Plato would have prophesied, and manners became endued with a grace not known before. A century later than the first of the troubadours came the noble Minnesingers of Germany, first rising to importance in Barbarossa's time (1152–1190), and dying out with Frauenlob in 1318, not, however, before they had done work for Germany like unto that accomplished by the troubadours for France and for the adjacent parts of Spain and Italy. The Minnesingers were succeeded by a very important class of musicians and poets, the Meistersingers of the great towns. Here for the first time we find the common people rising to their present place as rulers of the world (actually so, though not always in appearance), and it speaks volumes for the truth of the Greek reverence for the educational power of music that the rise of the strong German burgher-system should be accompanied by a remarkable municipal movement in musical culture. (The Greek life, noble as it was, reposed on slavery as its basis, but it must always be remembered that true democracy was then altogether unknown.) The renowned Hans Sachs, musician, poet, and shoemaker, of Nuremberg, lived from 1494 to 1576, and marks the culmination of the epoch. The Meistersingers formed a guild like that of any other civic art, with apprentices, rules, and officers, and at periodical contests the candidates sought for admission, the public being the judges whether their song was according to the well-known rules of the guild. Similar guilds sprang up in France and England, but the records are not perfect, as are those of Germany.

The next remarkable musical move-

ment, also coinciding with a no less remarkable rise of a people, is the School of the Netherland Musicians, which has in fact founded our modern music, and which sprang into being in the middle of the fourteenth century, just as that civic life began to stir which was to blossom, later on, into the magnificent civic life of the great Flemish and Danish cities. These Netherlanders passed into Italy, and there founded the Roman Church style; into England, and there founded the great Madrigalian style. It is to these men that counterpoint is due, and also harmony in our sense of the word. Again, music springs up as a great educational power in the rise of the Lutheran Reformation. The new musical form of the chorale or hymn tune coincides with the new religious life; and in the South the motet and the oratorio show that in the Catholic Church, too, men's minds are awakening. The value Luther set on music is well known, and his own contributions to the art are noble and dignified, and above all characteristic. We have spoken of a great Madrigalian style in England, and let it be observed that the sudden rise to greatness under the Tudors, the large enthusiasms, the noble scorn of all that is common or mean, the boundless courage and enterprise, the truly artistic nature, which make especially Elizabeth's time stand out gloriously in our annals, coincide with the development of an intense popular love for music, especially among the upper classes. So completely was this the case that an ambassador notes the usual practice of handing round 'parts' (not scores) amongst the company at a festival, that the pleasure of concerted music might be enjoyed. Each man took it as a matter of course that he should bear his part. The narrator confesses how, for want of training, he had awkwardly to decline. The great queen herself was a noteworthy performer. Observe how under the unmusical rule of the Stuarts the temper of the nation declines, then hardens into the fierce rebound of Puritanism. Later on, observe how when Charles II. sapped the noble life of England, the characteristic music was the 'French violins,' that degrading love of the froth of foreign nations and neglect of native art, and of the truer, if colder, regions of pure, noble, and ideal beauty, which has more or less continued down to our own day.

Returning a moment to Elizabethan times, we observe the rise of opera, the next great musical form, to be directly due to the rise of the great Florentine republic and the Renaissance; for it came out of a praiseworthy attempt by the father of the astronomer Galileo and some of his friends to resuscitate the *melos* of the ancient Greek tragedy.

During the eventful reign of Queen Victoria we have seen the rise of another national movement, the assumption by the democracy of the power in the State. Political power once theirs, we have seen the people thirsting for education, for culture. Now, it is indeed remarkable that with this again we have a fresh development of music. For, whereas Handel was put to straits, even in a cathedral town, for some one to sing a chorus part that he might judge of the effect ('Yes, I can sing at sight,' the man replied to the furious composer, 'but not at *first* sight!'), we, not much more than a century later, can summon, if we like to get a room large enough for them, 4,000 or 5,000 amateur vocalists, in any part of England, at a week's notice, competent to perform most difficult music. Our educational code demands music as a necessary part of education; we have a new musical method, that of the *Tonic Sol-fa System*, which enables thousands on thousands who have but limited time to gain a knowledge of all the simpler effects of vocal music. Our church choirs are full and overflowing. Musical festivals of colossal dimensions are held triennially in a dozen places in England, on a scale that no continental nation can dream of rivalling. We have three or four great musical schools: the Royal Academy, the Royal College, and the great school due to the munificence of the city of London, the Guildhall School; and all these and others are crowded, and overcrowded, with scholars.

Is it merely accidental, this contrast, which has just been made apparent, with the time of the Georges, and with other nations less free than ourselves? Or is it not true what Solon, Pythagoras, Plato, and the rest of the great Greeks said, that music is the grand educational agent for all who wish to elevate the soul, to co-ordinate the faculties, to humanise the passions, and to stir the intellect? We believe that it is true; that from Lord Chesterfield, who forbade his son to de-

grade himself by learning the violin, to Prince Albert and Mr. Gladstone, who in our time (after the fashion of Pythagoras) have been accustomed to sweep the cobwebs from their brain with music, and with music to nerve themselves for fresh labours, there is a great gulf fixed. The one is ill-educated with all his learning; he has put out an eye or cut off a limb of the mind; he is self-blinded, one-sided. The other knows, with Plato, that 'every particle of human life has need of rhythm and harmony.'

It is sometimes convenient to draw up a short list of a few of the best books in any art, in case a student may not be able readily to consult a master in his studies. The following are useful books, published in recent years, on the theory of music: *Harmony*, Sir G. A. Macfarren; *Counterpoint*, Sir G. A. Macfarren; by far the best and most consistent musical works on the subject, embodying in a practical form the excellent theories of Day. With these, for students preferring the ordinary views on music, and aiming merely at gaining a body of good grammatical rules, may be mentioned the *Treatise on Harmony* by Dr. Stainer. Banister's *Music* is a comprehensive little book, giving a glance over the whole field. Prout on *Instrumentation*, Higgs on *Fugue*, Stainer on *Composition*, and Stone on the *Physical Basis of Music*, are four of Novello's primers, of great value and merely nominal price. *Six Lectures on Harmony*, by Sir G. A. Macfarren, is a book richly repaying the student. Of histories, the recent English translation of Naumann is very good; and the slight little volume of Bonavia Hunt, a well-arranged compendium of dates, with remarks on them, is useful in its way. The two series of *Lectures on Musical History*, by John Hullah, are priceless. Fillmore's *History of Pianoforte Music* (Sonnenschein) is extremely good. In acoustical theory Helmholtz on *Sensations of Tone* (tr. Ellis) is unrivalled, Tyndall's *Sound* is very valuable, Sedley Taylor's work is highly interesting. The *Tonic Sol-fa* works by Curwen are easily obtainable, and extremely easy to understand. A *Sol-fa* harmony and a counterpoint are also done, but students who mean earnest work would probably prefer the usual notation.

An attempt to show how in teaching children the pianoforte a genuine knowledge of the rudiments of music, of the power to write it down, and of its meaning to the mind, may be given by adopting the educational principles of the Kindergarten System (*q.v.*), is due to H. Keatley Moore; and a graduated series of six small works (under the title of *The Musician*) carrying on a similar view, suggesting courses of study, and analysing the pieces chosen, has been produced by Ridley Prentice. These works will probably be found of great use by teachers rather than by students, on account of the freshness of their view of the subject. For those who desire to penetrate the mysteries of the psychology of music, the secrets of its construction, there is really only one good book, the *Harmonik und Metrik* of Hauptmann, of which the English translation, by Heathcote and Moore, appeared at the beginning of 1888. These last three works are published by Sonnenschein & Co. (*See* SINGING.)

N

National Art Training School.—This school is a development of the former School of Design and Central School of Art at Somerset House, and its special object is the training of art teachers of both sexes, of designers, and of art workmen, to whom facilities and assistance are afforded in the shape of scholarships, maintenance allowances, and complete or partial remission of fees. A school for the instruction in art of general students is attached to, and serves as a practising school for, the training school. In 1853 the school was removed from Somerset House to Marlborough House, and opened under the designation of 'National Training School of Art.' In 1856–57 the school was transferred to South Kensington. In 1863 a system of scholarships was established, open to candidates from local schools. In 1871, with a view to enable the school to fulfil more efficiently its primary object of training masters for art schools, it was found necessary to impose an examination test for all candidates for admission, and to make certain alterations in the regu-

lations of the schools, introducing payments on results.

The course of instruction is as follows, though it is understood that it is not progressive in the order in which the stages are named: (1) linear drawing by aid of instruments, including linear geometry, mechanical and machine drawing, perspective, details of architecture, and sciography; (2) freehand outline drawing of rigid forms from flat examples or copies; (3) freehand outline drawing from the 'round;' (4) shading from flat examples or copies; (5) shading from the 'round' or solid forms and drapery; (6) drawing the human figure and animal forms from copies; (7) drawing flowers, foliage, and objects of natural history from copies; (8) drawing the human figure or animal forms from the 'round' or nature; (9) anatomical studies, drawn or modelled; (10) drawing flowers, foliage, landscape details, and objects of natural history, from nature; (11) painting ornament from flat examples; (12) painting ornament from the cast, &c.; (13) painting (general) from flat examples or copies, flowers, still-life, and landscapes; (14) painting (general) direct from nature, flowers, or still-life, landscapes, and drapery; (15) painting from nature groups of still-life, flowers, &c., as compositions of colour; (16) painting the human figure or animals in monochrome from casts; (17) painting the human figure or animals in colour; (18) modelling ornament; (19) modelling the human figure or animals and drapery; (20) modelling fruits, flowers, foliage, &c., from nature; (21) time sketches in clay of the human figure or animals from nature; (22) elementary design, including studies treating natural objects ornamentally, ornamental arrangements to fill given spaces in monochrome or modelled, ornamental arrangements to fill given spaces in colour, and studies of historic styles of ornament drawn or modelled; (23) applied designs, technical or miscellaneous studies, including machine or mechanical drawing, plan drawing, mapping, and surveys done from measurement of actual machines, buildings, &c., architectural design, ornamental design, as applied to decorative or industrial art, and figure composition, and ornamental design with figures, as applied to decorative or industrial art, both flat and in relief.

Certificates of competency to teach the subjects included in these twenty-three stages of instruction are given to candidates who pass the necessary examinations, and are called (*a*) the preliminary or Art Class Teacher's Certificate, and (*b*) Art Certificates of the Third Grade.

National Education League (The) was founded in Birmingham in the early part of 1869, its primary object being 'to secure the education of every child in England and Wales.' This it was proposed to effect by the following means: (1) local authorities to be compelled by law to see that sufficient school accommodation is provided for every child in their district; (2) the cost of founding and maintaining such schools as might be required to be provided out of the local rates, supplemented by Government grants; (3) all schools aided by local rates to be under the management of the local authorities, and subject to Government inspection; (4) all schools aided by local rates to be unsectarian; (5) to all schools aided by local rates admission to be free; (6) school accommodation being provided, the State or local authorities to have power to compel the attendance of children of suitable age not otherwise receiving education. At the first annual meeting, which was held in Birmingham on October 12, 1869, Mr. George Dixon, M.P., the originator of the movement, was unanimously elected president. The report, which was adopted, set forth that the League was formed in consequence of the alarming state of ignorance revealed by the investigations of the Manchester and Birmingham Education Aid Societies. In Manchester and Salford it was ascertained the number of children between three and twelve years of age, of all classes, was 100,000, and that of these only 55,000 were on the books of the elementary schools, while the average attendance was no more than 38,000. In Birmingham the case was still worse. The number of children in that town between the ages of three and fifteen was 45,056, and of these 17,023 were at school, 6,337 were at work, and 21,690 were neither at school nor at work. Nor did the case end here, for it was found that the education of those at school was most unsatisfactory. From independent investigations made in London it was estimated that there were between 150,000 and 200,000 children without the means of

education. These facts, and many others which had been laboriously collected, led to the inference that the voluntary system had failed, and that justice and expediency alike demanded that a national system should be established. Hence the formation of the League. It was announced at the meeting to which reference has been made, that the League had been joined by 3,500 persons, including forty members of the House of Commons and between 300 and 400 ministers of religion. The League carried on an active propaganda for several years, branches being established in every town of importance in the kingdom. It took a leading part in the popular opposition to the twenty-fifth clause of Mr. Forster's Education Act (the clause sanctioning the payment of Government grants to denominational schools), to which the Nonconformists especially were averse. In March 1877, its main objects having been achieved, the League was formally dissolved. The immediate consequence of the formation of the League was the establishment of a rival organisation, *The National Education Union*, which had its headquarters at Manchester. The final congress of this body was held in that city on November 3, 1869, the late Earl of Harrowby presiding. Its avowed object was 'to secure the primary education of every child by judiciously supplementing the present denominational system of education;' and in the report it was stated that the formation of the National League in support of secular education necessitated 'a union of all in favour of denominational teaching.'

National Education Union (The). *See* NATIONAL EDUCATION LEAGUE.

National Schools.—Schools of the National Society (*q.v.*). *See* also CLASSIFICATION and CODE.

National Society.—The 'National Society for Promoting the Education of the Poor in the Principles of the Established Church throughout England and Wales' grew out of the labours of Dr. Bell. It was founded in 1811, and incorporated in 1817. The object is defined by its title. To carry out this object it strove to establish schools, and to provide suitable teachers for them; and, since Board Schools, necessarily unsectarian, have become a large factor in popular education, it has emphasised its declaration in favour of distinctive religious teaching. The connection of the Society with the Established Church placed at its disposal a powerful and far-reaching organisation, and its growth was, therefore, rapid. In 1812 there were fifty-two schools, with 8,620 pupils, in union with it; next year there were 230 schools with 40,484 scholars; and now more than half the elementary schools of the country are connected with it. The training of teachers began in a humble way at the Central Schools in Baldwin's Gardens, Gray's Inn Lane, but with the increasing number of schools, and the consequent increasing demand for qualified masters and mistresses, the Society established, one after the other, five institutions, which up to 1887 have trained 8,296 students. Three of these institutions—St. Mark's, Chelsea, and St. John's, Battersea, for masters, and Whitelands for mistresses—still exist. The other church colleges are not under the direction of the Society, but it makes them a grant for each of their students who passes the archbishops' examination in Scripture. When the Committee of Council was appointed in 1839, it proposed to establish a State training college, but the Church opposed the proposal with a vigour which almost wrecked the Government of Lord Melbourne. The ground of opposition was twofold: in the first place Dissenting students were to be taught religion by their own ministers, and in the next the Church claimed under the canons of 1604 a monopoly of the functions of training and licensing teachers. For some time the controversy raged in Parliament and the press. By drawing the attention of Churchmen very forcibly to the claims of the National Society, it largely increased the funds of the institution. In 1838–39 the income from donations and subscriptions was 2,842*l.*; in 1839–40 it was 17,339*l.* The normal income is now about 12,000*l.* Before 1839 there was no uniformity in the terms on which schools were affiliated to the Society; in many cases the desire of the managers for affiliation was considered sufficient guarantee for the nature of the instruction to be given. Since 1839, however, the Society has required the insertion in the trust deed of any school asking to be united to the Society, of a clause providing that the school shall be conducted 'according to the principles, and in furtherance of the ends and designs,' of the Society. In the

statistics of the Education Department there is no distinction made between Church schools affiliated to the Society, and those not so affiliated. The Blue Book for 1887 gives the number of Church schools in England and Wales as 11,864, providing accommodation for 2,548,673 children, with 2,136,797 on the rolls, and 1,634,354 in average attendance. Their income was 133,159*l.* from endowments, 586,950*l.* from voluntary contributions, 869,026*l.* from fees, 1,344,115*l.* from Government grants, and 33,732*l.* from other sources. The Society's charter of incorporation provides that the Archbishop of Canterbury shall be the president, and that 'the Archbishop of York and all the bishops, and ten other persons being either temporal peers or privy councillors,' shall be vice-presidents. The Rev. James Duncan, M.A., is the secretary, and the offices are in the Broad Sanctuary, Westminster.

National Union of Elementary Teachers (N.U.E.T.).—Before 1870 each class of teachers—British, Church, and Wesleyan—had an association of its own. These were, separately, too weak to influence public opinion; indeed, they appeared to exist chiefly to discuss methods of teaching, and to provide opportunities for social intercourse. The passing of the Education Act, by enlarging the scope of education, quickened professional spirit, and made teachers think more of their common interests than of their denominational differences. The leaders of the associations consequently held several meetings at King's College, London, to discuss the basis for a National Union of Elementary Teachers. From the first it was resolved that the union should be one of associations, and not of individual members, and that each association should consist of the teachers of a particular district, not of a particular sect. In 1870 there were 26 associations, with 400 members. By 1881 the Union had grown to 321 associations, with 13,178 members. Then there was an increase in the annual subscriptions, which led to a falling off in the numbers. In 1884 there was a further increase in the subscription, but as the additional sum was to form a Legal Defence Fund—a very tangible benefit—the loss of members was only temporary. At the end of 1886 there were 314 associations, with 12,431 members. Connected with the N.U.E.T. there are a 'Teachers' Benevolent Fund,' a 'Teachers' Orphanage and Orphan Fund,' and a 'Teachers' Provident Society.' The Benevolent Fund grants temporary relief in cases of distress, illness, accident, or sudden emergency, gives loans for short periods, makes grants to widows, and pays annuities to incapacitated teachers. The Orphanage and Orphan Fund maintains an orphan school for boys at Peckham Rye, and another for girls at Sheffield, and pays 'home allowances' when the orphans are living with friends. The Provident Society offers means whereby teachers can be, in sickness or old age, beyond the need of benevolence. The offices of the Union are at 30 Fleet Street, and the General Secretary is Mr. T. E. Heller.

National Union for Improving the Education of Women. *See* EDUCATION OF GIRLS.

Nations. *See* RECTOR.

Natural Aptitude, Natural Talent.—By these terms is meant a special degree of innate capacity for some particular mode of intellectual or practical activity. Thus we speak of a natural aptitude for scientific discovery, the study of languages, artistic design, or mechanical contrivance. Such original aptitude commonly involves not merely a superior degree of mental power of a special kind, but a high degree of perfection of one or more of the organs of sense and of the muscular organs. It also implies a predominant taste for and impulse towards the particular pursuit. Individuals differ widely in their particular aptitudes, and these differences constitute much of what we mean by individuality on its intellectual side. As the history of great men tells us, natural aptitudes are frequently inherited. It behoves the educator to make a careful study and estimate of the natural aptitudes of children, so as to adapt the course of education to some extent to these. (*See* INDIVIDUALITY and ORIGINALITY.)

Natural Philosophy. *See* PHYSICS.

Nature is the name of the sum total of the processes and laws of the material world in which we live. It is a sphere which contrasts with that of conscious and purposive human action. Hence nature is commonly opposed to art, which is action elaborated into a rational method. All that is instinctive in ourselves is referred to nature as its source, and distinguished from that which is designedly

produced by the art of education, or, to use Mr. Galton's antithesis, by nurture. Nature is a term that has played a considerable part both in ethical and educational writings. The precept 'Follow nature' has been erected by ancient and by modern moralists into the ultimate moral principle. And modern pædagogic writings are full of references to nature and her methods of teaching as our proper model. It is probable that the word is frequently used in this connection with a certain degree of vagueness. The work of the educator is, *pace* Rousseau, to make good the deficiencies of nature, i.e. the spontaneous tendencies of the child, and to a considerable extent to oppose and counteract its forces. In order to do this, however, he must carefully study the workings of nature, and adjust his procedure to its unalterable laws. Thus it is a fixed principle in modern education that the order of instruction must follow that of the development of the child's faculties (*see* ORDER OF STUDIES). The teacher must, therefore, work with nature, that is, according to natural and unalterable conditions, even though he aims at an ideal result far above the reach of nature's unaided powers. (*See* for a careful analysis of the term 'Nature' Mills's article 'Nature' in his *Essays on Religion*; cf. Payne, *Contributions to the Science of Education*, chap. vii.; and Compayré, *Cours de Péd.*, p. 21.)

Navy (Education for the). *See* EDUCATION FOR THE NAVY.

Needlework.—(1) In the scheme of public elementary education needlework is obligatory for girls in day-schools, and it is frequently taken up by boys as well. One of the conditions required to be fulfilled by a school in order to entitle it to an annual Parliamentary grant is, that the Department must be satisfied 'that the girls (in a day-school) are taught plain needlework and cutting-out as part of the ordinary course of instruction' (*New Code*, Art. 96 (*b*)). The grant for needlework is 1*s*., and it is calculated on the average attendance of girls only, unless the boys are taught the subject (Art. 106 (*c*)). In 1886 the grant of 1*s*. under this article was earned in 11,484 schools and classes (97·75 per cent.), and by an average attendance of 883,418; it was not earned in 264 schools and classes (2·25 per cent.). The infant boys obtained a fair share of the grant; out of an average attendance of 528,592 boys the grant was earned by 422,258 (80·07 per cent.). In schools for older scholars also there may be obtained a similar grant of 1*s*., calculated on the average attendance of girls only (Art. 109 (*c*)); and needlework is one of the recognised class subjects for which there may be obtained 'a grant on examination amounting to 1*s*. or 2*s*. for each subject, if the inspector's report on the examination is fair or good' (Art. 109 (*f*)), but this grant cannot be obtained along with the grant under Art. 109 (*c*). In 1886 the grant under Art. 109 (*c*) was recommended on account of the girls in 10,493 (58·74 per cent.) departments; it was not paid in 560 departments (3·14 per cent.), with an average attendance of 21,326 (1·84 per cent.); the remainder of the schools eligible for a grant for needlework 6,809 (38·12 per cent.), with an average attendance of 681,080 (58·89 per cent.), made their claim for it as a class subject under Art. 109 (*f*) vi 'It is the smaller schools that claim for needlework under Art. 109 (*c*), the average "number for payment" per school under this article being 43 as against 100, the average for schools claiming grant as a class subject' (*Report* for 1886–87, p. xxi.). The requirements of the Code are set forth in Schedule III., and the Department is of opinion that 'the obligatory parts contain no more work than can be fairly mastered by any girls' school in which four hours weekly have been devoted to this subject' (*Report*, 1886–87, 'Minutes and Instructions,' sect. 42, p. 169). In the first two standards hemming, seaming, and felling are required. Standard III. adds stitching, sewing-on straight, herring-bone stitch (only on canvas or flannel), and simple darning (on canvas). Standard IV. introduces gathering, setting-in, button-holing, and sewing on buttons, with simple marking (on canvas), plain darning (as for thin places) in stocking-web material, and herring-bone patch (at least 3 inches square) on coarse flannel. Standard V. requires the running of a tuck, plain darning of a hole in stocking-web material, and patching in calico and flannel. Standards VI. and VII. add whip-stitch and setting-on frill, with plain darning on coarse linen, and patching in print. Besides, garments must be shown in each standard, in the same condition as when completed by the

scholars: in Standard III., say a pinafore, shift, or apron; in Standards IV. and V., say a plain night-shirt, night-gown, or petticoat; in Standards VI. and VII., say a baby's night-gown or child's frock. In Standard V. cutting-out is reached, the requirement being the cutting out of any garment, such as is required in Standard III.; in Standards VI. and VII. the cutting out of any under-garment for making up in Standard IV. In the first three standards each garment must be entirely made by its own Standard; in Standard IV. and upwards each girl must present a garment made by herself. Further, knitting is included, and runs through the grades of comforters, muffatees, socks, stockings, and the like. The pupil-teachers' (girls) requirements, which are also set forth in Schedule III., correspond largely with the four highest standards of the girls' and infants' departments, but are somewhat more advanced. My Lords specially urge that 'the material used should not be so fine as to strain the eyesight of the children.' 'In many schools,' says Mr. Blakiston (*Report*, 1886–87, p. 274), 'the teacher's efforts are marred, and systematic teaching hindered, by mothers being allowed to send garments, not only of unsuitable material, but involving unsuitable stitches, to be made up in school. We do our utmost,' he continues, 'to induce managers to supply suitable materials, and to recoup the cost by the sale of garments sensibly planned and cut out and made up under the eye of the teacher. It is the latter's fault if any serious loss ensues, as is the case where she takes no pains to consult the taste of her customers.' This latter responsibility cast upon the mistress we consider to be most unfair, wholly extraneous to her proper duties, and calculated to keep her mind in cruel anxiety. The scheme of requirements and the mode of inspection are by no means generally accepted as satisfactory. One lady witness before the recent Royal Commission on the working of the Elementary Education Acts, declared that 'the needlework is all wrong throughout the country, every bit of it.' For example: 'It is ridiculous for a gentleman to examine needlework; he may do it to a certain degree—he may see evenness, but he does not know whether that evenness is in the right direction or in the wrong direction' (*Second Report*, 1887, C. 5056, p. 176). Some of the inspectors, however, do know; but there is undoubtedly not a little point in the criticism. (2) In the syllabus for female candidates for the Training Colleges the requirements (1887) are as follows—First year: the cutting out, making, and repairing of any plain article of underclothing; the drawing of diagrams on sectional paper—a woman's chemise, an infant's shirt, a pair of drawers for child of five; the answering, on paper, of questions on needlework. Second year: the higher branches of plain needlework, including tucking, whipping, and feather-stitching, the repairing of linen and print, and darning in stocking-web stitch; the drawing of diagrams on sectional paper—a woman's nightdress, a boy's shirt, a child's muslin pinafore; the cutting out and making of the above garments; the answering, on paper, of questions on needlework. (See *Plain Needlework* and *Plain Cutting-out*, both by the Examiner of Needlework to the School Board of London (Griffith, Farran, Okeden, & Welsh); and *Plain Needlework and Knitting*, by Brietzcke and Rooper (Swan Sonnenschein, Lowrey, & Co.).

Needlework, The Royal School of Art, in Exhibition Road, South Kensington, was founded in 1872, under the presidency of the Princess Christian, for the twofold purpose of supplying suitable employment for gentlewomen who wish to eke out an insufficient fortune, and restoring ornamental needlework to the high place it once held among the decorative arts. It is not a Government institution. In 1878 it was placed on a permanent basis by incorporation of the original association. The ultimate profits, after payment of the debentures, are to be applied to such charitable or other purposes as the association may from time to time determine, not being inconsistent with the provisions of the memorandum of association, which requires that the shareholders shall not take any personal profit out of the association. There are classes for the instruction of amateurs in every kind of stitch in crewel, silk, and gold, and the School holds itself prepared to supply all sorts of ecclesiastical embroidery. Applicants for *admission as qualified workers* must (1) be gentlewomen by birth and education, and (2) be able and willing when employed to devote seven hours a day to work at the School. Every applicant is required to go

through a course of instruction, consisting of nine lessons in Art Needlework of five hours each, for which the charge is 5*l*. When the course is completed, and the teacher has certified to the due attendance and sufficient skill of the applicant, her name is registered in the list of the qualified workers of the school. Such registration does not entitle the lady to any employment from the school, but simply renders her qualified for employment whenever the School may have need of her services. The School has agencies in the principal towns of England, and in Canada and in the United States of America.

Newnham College. *See* EDUCATION OF GIRLS and TRAINING OF TEACHERS.

Newman, Cardinal. *See* RENAISSANCE and UNIVERSITIES.

New Zealand University. *See* UNIVERSITIES.

Niemeyer, August Hermann (*b.* 1754, *d.* 1828), German educationist, became in 1779 professor of theology in the University of Halle, and inspector of the Halle Theological Seminary, and in 1787 principal of the teachers' seminary in the Francke Institution. His *Principles of Education and Instruction* (1799) was the first attempt at systematising German pedagogy and at aiming at a history of education. This work has run through many editions, the first eight editions being edited by himself.

Normal College and Academy for the Blind. *See* EDUCATION OF THE BLIND.

Normal Schools. *See* TRAINING OF TEACHERS.

Normal School of Science and Royal School of Mines, South Kensington and Jermyn Street, is an institution to supply systematic instruction in the various branches of physical science to students of all classes. While the school is primarily intended for the instruction of teachers and of students of the industrial classes selected by competition in the examinations of the Science and Art Department, other students are admitted so far as there may be accommodation for them, on the payment of fees fixed at a scale sufficiently high to prevent undue competition with institutions which do not receive State aid.

The Royal School of Mines is affiliated to the Normal School. Students entering for the associateship of the School of Mines obtain their general scientific training in the Normal School. Instruction is given in the school in the following subjects: mechanics and mathematics, physics, chemistry, biology and botany, geology and mineralogy, agriculture, metallurgy and assaying, mining, elements of astronomical physics, practical geometry, mechanical and freehand drawing. Occasional students may enter for any course of instruction, or for any number of courses, in such order as they please; but students who desire to become associates of the Normal School of Science, or of the Royal School of Mines, must follow a prescribed order of study, which occupies from three to three and a half years. In the first two years the students must all go through the same instruction in mechanics and mathematics, physics, chemistry, elementary geology, astronomy, and mineralogy, with drawing; afterwards they must elect to pass out in one or other of the eight divisions, to the subjects of which the third and fourth years' studies are entirely devoted, namely: (1) mechanics, (2) physics, (3) chemistry, (4) biology, (5) geology, (6) agriculture, (7) metallurgy, (8) mining.

A student who passes in all the subjects of the first two years, and in the final subjects of divisions 1, 2, 3, 4, 5, or 6, becomes an associate of the Normal School of Science; while, if he takes the final subjects of divisions 7 or 8, he becomes an associate of the Royal School of Mines. The work of the school is arranged in such a manner as to permit the student to concentrate his attention upon one subject at a time, and he is never occupied with the subjects of more than two divisions in the same term. There are twelve Royal Exhibitions to the Normal School of Science and Royal School of Mines, besides a number of free studentships and scholarships.

Notes of Lessons.—Dr. Arnold of Rugby, though unusually well acquainted with Roman history, used to prepare all his lessons on the subject as carefully as if it were new to him, and when some one expressed surprise at this he replied, 'I want my boys to drink out of a running stream, rather than out of a stagnant pool.' No teacher can be successful who does not give thought beforehand to the matter and the method of his lessons. A general, even a minute, knowledge of the subject is not enough. We must consider what

are the facts to which we will draw attention, which of these we must tell, and which we can elicit, what illustrations we can employ, and what exercises will best impress the whole upon the pupil's memory. The fulness of a teacher's notes of a lesson will depend largely upon whether they are meant for his own use only, or for the inspection of another. If for his own use only, they will, so long as he is dealing with a familiar subject, give the merest outline of the matter, and the briefest hints of the method and illustrations; when the subject is unfamiliar the matter will be given more fully. Pupil-teachers in elementary schools, students in training-colleges, and all who submit to the examinations of the Education Department have very often to write notes, not for their own use, but to show an inspector how they would give a set lesson. In these cases the notes must be self-explanatory, and indicate clearly not only what would be taught, but how it would be taught.

O

Obedience and Disobedience.—By an act of obedience we understand an action performed in response to some command. The external form must here be distinguished from the internal reality. A true act of obedience involves not merely the outward compliance with a command, but the inward attitude of submission to authority. Thus, a boy who refrains from a prohibited action merely to escape a dreaded form of punishment, whilst he hates the preceptor who imposes the prohibition, does not in the full sense obey. Obedience is of two kinds. Of these the first is that which is given without any recognition of the reasonableness of the command and solely in deference to a personal authority. This is Kant's 'absolute obedience.' The second kind is the intelligent and free obedience to law which the subject cordially accepts as good. The educator of the young is directly concerned with securing the first kind of obedience. Here the influence of respect and affection for the personality of the governor counts as an important condition of securing true obedience. This respect is to be gained partly by the habitual display of impartiality or fairness in administering discipline, by a perfectly consistent example of good conduct, and by a judicious mixture of kindness and firmness. The principle of habit is strikingly illustrated in the practice of obedience. A child that has always been accustomed to obey does so at last without any sense of effort (*see* HABIT). Of all the moral habits obedience most imperatively demands to be cultivated in the first years of life. An infant should be trained in the rudiments of obedience as soon as it understands a prohibitory word or sign. And when the utmost has been done by the parent to lay the foundations of the habit there need be little fear of disobedience afterwards to any properly enforced authority. Disobedience has been divided into two kinds: that proceeding from a dull, sluggish will, as where a child fails to attend to a command; and that which arises from energy of the individual will, or self-will. Each of these requires its own mode of treatment. In dealing with the second kind the teacher should remember that the energy of will which shows itself in the disobedient act is itself good, and requires directing rather than suppressing. He should be careful to avoid the appearance of a struggle of individual wills for mastery. In all cases alike, as Kant has shown, the preceptor should have as his goal the free self-imposed obedience to law of the good will, and should seek by all the agencies of moral education to train the young mind in a clear discernment of the grounds of the commands imposed and in free acts of moral choice. (*See* M. Edgeworth's *Practical Education*, vii., articles 'Gehorsam' and 'Ungehorsam,' in Schmidt's *Encyclopädie*, cf. articles 'Discipline' and 'Moral Education.')

Ober Real. *See* LAW (EDUCATIONAL), sec. *Saxony*.

Object Lessons.—Prof. Bain complains (*Education as a Science*, page 134) that 'object lessons' is a 'very ambiguous and misleading phrase.' Here it means lessons on sensible things, and on the phenomena of nature. The purpose of such lessons is:—(i.) *To form habits of observation.* One

of the chief defects of school methods is that, to a large extent, telling takes the place of teaching, cramming of education. Facts which children are told are artificial flowers; facts which they are made to find out are living plants, and it is the very essence of a good object lesson to make the pupil discover for himself everything which his senses can reveal. (ii.) *To form habits of reasoning.* A skilful teacher does not rest content with getting his scholars to observe for themselves (though that is a great point gained); he also tries to make them think for themselves. The first step is to note a fact, the next to seek the cause. Little ones, probably, cannot find that without aid, but by careful questioning it can generally be elicited. (iii.) *To increase knowledge of 'common things.'* It is possible to inform without educating, but it is not possible to educate without informing, and as to the kind of information, it may be said that good teaching, like charity, begins at home.

Object lessons ought to have the first place in infant schools, and not the last place in junior schools; in senior schools they ought to be replaced by specific science lessons for which they prepare the way. Object lessons should be given in courses carefully planned and leading up to clearly defined ends. The scheme issued by the School Board for London, as a suggestion to its teachers, is so thoughtfully devised as to be worth quoting. It is, briefly, as follows:—For infants. A few objects should be selected from each of the four following groups:—(*a*) *Domestic Group.*—The school-room itself, with door, chair, table, desk, fire-place, and clock. The child's coat, cloak, frock, cap, shawl, and boots. Pins, needles, knife, scissors, bell, and kettle; to which may be added any other articles of school or house furniture, clothing, or common utensils. (*b*) *Animal Group.*—First in importance comes the child itself, afterwards the cat, dog, horse, cow, sheep, cock and hen, sparrow, herring, fly, beetle, to which may be added any other familiar animals, such as donkey, rabbit, mouse, goose, canary, lark, pigeon, shrimp, crab, lobster, sole, plaice, spider, butterfly, bee, periwinkle, oyster, earthworm, &c. The parts of animals may form the subject of lessons, such as head, hand, foot, paw, eye, ear, mouth, nose, hair, feathers, wool, &c. (*c*) *Plant Group.*—The choice will depend upon the season of the year, and should include the nearest trees, and such smaller plants as are accessible, as the primrose, violet, daisy, crocus, dandelion, wallflower, hyacinth, geranium, and fuchsia, holly, cabbage, pea, bean, potato, onion, carrot, turnip, wheat, barley, oats. The parts of plants may also form subjects of lessons, as the wood, bark, leaves, flowers, seed, root, stem, &c., or special products, as apples, nuts, starch, sugar, gum. Attention should also be drawn to the simple phenomena of vegetable growth, by means of actual observation or experiment. (*d*) *Mineral Group.*—This should include any accessible stone, with chalk, sand, coal, salt, blacklead, and water, together with iron, brick, clay, sulphur, glass, &c. Opportunity should be taken of bright sunshine, black clouds, fogs, heavy showers of hail, rain, or snow, strong wind, a rainbow, or a thunder storm, to draw attention to these natural phenomena.

Standard I. Extension of the Object Lessons in the Infant School, with simple illustrative experiments. *Standard II.* Comparison of different plants or animals. Ordinary phenomena of the earth and atmosphere. Substances of domestic use. *Standard III.* Simple principles of classification of plants and animals. Further phenomena of the earth and atmosphere. Substances used in the Arts and Manufactures. *Standard IV.* More complete classification of plants and animals, with typical examples. The three forms of matter familiarly illustrated. *Standard V.* (*a*) Animal and plant life, with the most useful products, or (*b*) more definite notions of matter and force, illustrated by simple machinery or apparatus. *Standard VI.* (*a*) Animal and plant life, with special reference to the laws of health; or (*b*) the commonest elements and their compounds; the mechanical powers. *Standard VII.* (*a*) Distribution of plants and animals and the races of mankind; or (*b*) light, heat, and electricity, and their applications.

The most common faults in object lessons are:—(i.) *In the Matter.* This is often too hard, sometimes too easy. It is uninteresting in the one case because it is unintelligible, in the other because it is familiar. All that there is to teach on a subject cannot be taught in a lesson, and thus a teacher, while choosing matter which is neither too hard nor too easy, may yet

from the facts at his disposal make an unwise selection. The general rule is that besides being within the comprehension and beyond the knowledge of the children, the information introduced should be useful and interesting. (ii.) *In the Illustrations.* If the teacher is talking about an object he should always show a specimen of it. It may be quite common, but for children familiarity as well as novelty is attractive, and, besides, the teacher may wish to call particular attention to some feature which has hitherto escaped the pupil's observation. Pictures, valuable as they are, are only worth having when the thing itself cannot be got. A picture of a fish, for instance, will show the shape and position of the fins and of the gills, but a goldfish in a bowl, or even a stickleback in a bottle, will show fins and gills at work. Lessons which involve something of science are too often given without experiments; they might as well not be given at all. Sometimes when experiments are carefully prepared and skilfully performed, they are not properly explained. It must be borne in mind that an experiment is not necessarily an illustration. (iii.) *In the Language.* The most common fault in this is 'bookishness.' It is only after years of experience that teachers fully realise how small is the vocabulary of a child, especially of a child coming from an illiterate home. Lessons to little ones are sometimes quite unintelligible because the language is too difficult. (iv.) *In the Questioning.* With questions, as with illustrations, the most common fault is one of omission. The chief faults of commission in questioning are making the questions long and involved so that the pupil can scarcely follow them; or vague, so that it is impossible to say what the teacher wants; or clearly admitting of two answers, and thus encouraging guessing.

Obscurantists. *See* RENAISSANCE.

Open Queen's Scholars. Candidates who, not having been pupil-teachers, pass the examination for admission into a training college (the 'Queen's Scholarship' Examination).

Ophthalmia. *See* COMMUNICABLE DISEASES.

Optimes.—The title of those who gain honours next to the wranglers at the Cambridge Mathematical Tripos (*q.v.*); they are divided, according to merit, into Senior and Junior Optimes.

Oral Instruction.—The work of the teacher consists in training his pupils by inducing them to exercise their faculties, and in helping and enabling them to acquire knowledge quickly, soundly, and lastingly. To train the faculties properly the exercise employed must be suitable to their degree of development at the particular time. To ascertain what this is, and what mode and subject of exercise are most suitable, the teacher must enter into personal communication with his pupil; must question him, and make use of the answers he gives; and having found one mode or one subject of exercise unsuccessful, must try another. In the same way personal communication between the teacher and his pupil, and question and answer, are necessary when any person seeks to enable another to acquire knowledge quickly, soundly, and lastingly. For the teacher must ascertain what knowledge his pupil possesses, and how far it is sound; must exercise him in the use of that knowledge, and must make perfectly clear and interesting the connection of the new knowledge to be acquired with that already possessed. When we add to this the fact that the thing shown, the spoken word, and the living interest of the teacher are, by the nature of the child, much more readily intelligible to him, much more powerful in creating interest, and much more easily and quickly varied to suit every circumstance than the *written* symbol ever can be, we shall see the absolute necessity for the young of what is called '*oral instruction*;' and that this necessity increases with the youth of the child. For the particular characteristics of good *oral instruction* see articles on OBJECT LESSONS, QUESTION AND ANSWER, TEACHER, TEACHING AND LEARNING,' &c.

Orbilius Pupillus, the schoolmaster of Horace, and nicknamed by him *Plagosus* on account of his flogging propensities, was a native of Beneventum. Before adopting the profession of a teacher at Rome, where he settled in 63 B.C., he served first as apparitor (magistrate's officer), and afterwards as a soldier. He is said to have lived to be a hundred years old, and died about 15 B.C.

Orbis Pictus. *See* COMENIUS.

Order of Studies.—The proper order of studies, so far as this can be determined by theoretic considerations, must be decided by a reference to psychological and

to logical principles. The former, by showing us that the faculties develop in a fixed order (*see* DEVELOPMENT), require us to adapt the subjects of teaching to this order. Thus branches of instruction which, like the simple aspects of natural history and of physical geography, appeal mainly to the observing faculty and the imagination should, on psychological grounds, precede other branches, as grammar and mathematics, which make heavy demands on the faculty of abstract thought or reason. At the same time, these conclusions from psychological laws are modified by logical considerations which impose on the teacher the necessity of beginning with what is relatively simple and fundamental, and gradually going on to what is complex and derivative. Thus, mathematics, as the most general or abstract science, needs to be studied to some extent at the outset as the groundwork of all the sciences (*see* ABSTRACT SCIENCE). The best order of studies is that which most completely satisfies the general conditions of psychological development, and the more special conditions of logical dependence. (*See* article INSTRUCTION (COURSE OF); also Bain, *Education as a Science*, chap. vi. and vii.)

Organisation.—The work of a school naturally arranges itself under three heads: (1) *organisation*, which includes all that relates to the material and machinery of the school; (2) discipline, or that which has to do with the government and conduct of the pupils; and (3) teaching, or the training and instruction of their minds. Organisation includes the following matters: The site of the school and its sanitary arrangements; the size, shape, and disposition, &c., of the rooms; the playground and gymnasium; the dormitories; the mode of lighting, ventilating, and warming the class-rooms; the furniture and fittings of class-rooms, lecture-rooms, laboratories, &c.; apparatus, maps, pictures, &c.; books; registration of admission and attendance; office-work, &c.—all these refer to the *material* of the school. With regard to the *machinery* of the school the points to be considered are: the qualifications, duties, and distribution of the head of the school, the adult assistants, the pupil-teachers, monitors, officers, and servants; the classification of pupils, their arrangement in forms, sets, parallel classes, &c.; their promotion, superannuation, dismissal; place-taking, marking, and prizes; arrangements of subjects of instruction; hours for lessons and for preparation of lessons; playground and out-of-school regulations; dormitory regulations. Most of these points will be found treated in separate articles under their respective titles.

Originality.—This quality, the characteristic property of genius, is the most striking and interesting feature of individuality (*q. v.*). The original boy or girl is one whose ideas do not readily adjust themselves to the prescribed pattern, but arrange themselves in new forms. Originality thus always involves deviation from the average type of intelligence. At the same time, it is not necessarily abnormal as eccentricity always is. Originality implies exceptional mental power, but it differs from the superior aptitude for learning which takes a boy to the head of his class (*see* NATURAL APTITUDE). Hence the practical difficulties which arise in connection with the education of the gifted or original boy or girl. As the biographies of the great show us, the ordinary discipline of the school and the college is apt to obstruct rather than to promote the development of genius. The great mind must always be in an exceptional sense its own educator (*see* SELF-EDUCATION). A consideration of the rarity and high value of originality should put the preceptor on his guard against suppressing it by a too severe and inelastic mode of instruction.

Orthoepy. *See* ELOCUTION.

Orthography. *See* GRAMMAR.

Overpressure is the name now commonly given to the overwork in connection with school life. A knowledge and application of the physiological principles under which the brain works would prevent the possibility of its occurrence. The brain during the period of school life is a rapidly growing organ. At birth its average weight is from eleven to fourteen ounces, while in the European adult it averages between forty-nine and fifty ounces. Just as increased muscular exercise leads to increased size and strength of the muscles, so may increased brain exercise, during the period of its natural growth, increase the individual growth of brain. Growth in size and increase of complexity of the brain structure (which is involved in education) are, however, in some degree antagonistic to each other. If complexity of structure, with its corresponding mental maturity, is obtained at an early age, it is at the

expense of size of brain and real mental power. *Precocity* is generally followed by inferior mental organisation. The important point is so to combine work and recreation (always remembering that the brain requires abundant food and fresh air) as to obtain the best results in mental development. Ordinary school work, interrupted by vacations, seldom produces excessive strain of the mental powers of children. It is only in exceptional cases, where children are insufficiently fed, or are of a peculiarly nervous and excitable temperament, or the hours of study are unduly prolonged, that this result is likely to occur. *Headache* in such cases is one of the earliest symptoms, though this is more commonly the result of indigestion, bad atmosphere, or defects of vision (*see* EYESIGHT). The brain may become congested from overwork, and this would predispose to the production of meningitis (inflammation of the membranes of the brain). The most common cause of meningitis is, however, tubercular disease, and school work only at most tends to hasten the attack. Chorea (St. Vitus's Dance) has also been ascribed to school work, though with doubtful accuracy. After acute illnesses, as fevers, &c., it takes many weeks before the brain recovers its former condition of nutrition and power. Similarly, after severe blows on the head or concussion of the brain, prolonged mental rest should be allowed. Overpressure in school work is apt to occur when the school work is excessive or badly arranged, or when the scholar's health is depreciated from any cause. Deficient exercise, impure air, deficient clothing, or insufficient or unsuitable food, are all causes of incapacity for mental work, especially the last. *Home-lessons* are frequently given which require unduly prolonged attention; and when to this is added the fact that they usually have to be prepared in the evening, and frequently encroach on the time for amusement and meals, it will be evident that they are frequently a cause of mischief *A bad arrangement of school work*, as by having too long lessons, and no changes of occupation, may be responsible for some mischief. A change of subjects, as from languages or history to mathematics, means that different parts of the brain are exercised, and so a balanced action is secured, without overwork of any one part of the brain. The introduction of manual instruction in schools has an important part to play in the teaching of the future. *Examinations* are chiefly sources of overpressure when they are competitive in character; and girls, who have a more mobile nervous system and a greater preponderance of the emotional faculties, are peculiarly prone to suffer from them. When properly conducted an examination may be of great educative value, by finding out weak points, and stimulating the future efforts of scholars. It is when undue strain is put on children for some weeks before the date of an examination, that mischief may result.

In Prussia and various other States of Germany the question of overpressure has occupied much attention. In 1881 the whole question was referred by the Prussian Government to a special Commission, consisting of Professor Virchow and other eminent medical authorities. The report presented by this body is the last and most authoritative word that has yet been spoken on this question, so far as Germany is concerned. Overpressure is defined by the Prussian Commission as existing where 'the brain-work demanded of scholars is excessive, either as regards quantity or time,' or as 'the imposition of excessive labour on certain organs, to wit, the brain and nervous system, whether by demanding too much work of them in a given time, or by habitually keeping those organs at work too long a time together.' In Prussia overpressure has been inferred from the fact that the number of children of school age who commit *suicide* has been on the increase of late years. The Prussian Statistical Office reports that the number of children between ten and fifteen years of age who committed suicide in the year 1869 was 19. By the year 1881 the number of suicides of the same age had risen to 53. Between ten and twenty years of age the number of suicides had increased from 165 in 1869, to 260 in 1881. These figures are, however, rather misleading, as the percentage had remained the same in proportion to the population. Insanity was the cause to which a large proportion of the suicides of youths and girls from ten to fifteen years of age was attributed; but the Commission held that no proof had been adduced of the alleged tendency of education in the higher classes of schools to produce mental disorders. In various districts of Prussia such mala-

dies as headache, bleeding at the nose, and congestion of the brain among scholars appeared to be increased by their school work; but even on this point the Commission held that the evidence before them was quite inconclusive. It may be remarked that in Germany the question of overpressure has arisen mainly in connection with the higher grade schools, such as the *Gymnasia* and *Real-Schulen*, while in England complaints of this character have been connected chiefly with elementary education. In spite of the fact that the quantity and kind of mental work in the former make far greater demands on the scholars than in the latter, the Prussian Commission state their opinion that no conclusive evidence of overpressure has been produced as regards Prussian schools. On the general question of the effect of school work on the health of children, the following passages from the official report will be read with interest:—

'It is matter of common observation,' the Commissioners remark, 'that upon a large number of scholars, especially those of tender age, school life exercises a visibly weakening effect. The children lose their freshness of appearance; they become pale, show a loss of appetite, and feel fatigued and exhausted; their vision and energy decrease, and they become indifferent and inattentive, while their memory becomes uncertain, and their thoughts confused. The holidays, especially if spent in the country, restore them; the colour returns to their cheeks, they regain their vivacity of movement, and their mental activity is renewed. A few weeks after the resumption of school-work, however, the favourable effects of the holidays disappear, and after a few months the pupils are in urgent need of a fresh period of rest and recreation. The extent of the changes is exceedingly various in individual cases. With many scholars it is the central nervous system that is affected; in others the organs of digestion; in a third class the muscles and respiratory organs. The symptoms are sometimes fatigue and exhaustion, and in other cases nervous irritation of every degree up to spasmodic convulsive fits. The removal of such children from school for a longer or shorter time is often then advisable. Many children no doubt date their permanent condition of mental or physical weakness from this period.

'Yet it is our opinion,' continues the report, 'that this weakness is not attributable simply to overpressure. The vitiated atmosphere of schools, and in many cases faulty domestic arrangements, have much to do with it.' The Commissioners recommend teachers to study the individual characters of pupils. 'There is no constant standard,' they add, 'by which the limits between overpressure and an admissible amount of work can be determined. What in some cases is allowable is in others overpressure. The symptoms of the latter are only to be perceived afterwards; but whether they can always be properly distinguished by teachers without medical assistance is very doubtful.' The Commissioners hold that competent medical assistance is required to collect the materials to form a conclusive judgment on the question of overpressure in Germany. Still, 'overpressure depends more on the teacher and the method of teaching than on anything else.' *See* CONSUMPTION.

Owen, Robert. *See* YOUNG CHILDREN (EDUCATION OF).

Owens College. *See* PROVINCIAL COLLEGES.

Oxford. *See* UNIVERSITIES.

Oxford and Cambridge Schools Examination Board was established by articles of agreement between the Schools Examination Delegacy and Syndicate of Oxford and Cambridge respectively, November 8, 1873. The Board consists of the Vice-chancellors and twelve other members of each University, appointed from time to time by election and nomination. There are two secretaries. The organisation of the Joint Board is quite distinct from that of the Syndicate and Delegacy of *Local* Examinations (*see* SYNDICATE). The work of the Joint Board, which is concerned with 'secondary' schools (schools with a regularly constituted governing body, or which send a fair proportion of pupils to the Universities), is of two kinds:

I. To examine and report on the work of schools and parts of schools by arrangement with the head-master or governing body.

II. To hold a yearly examination at such schools as desire it, and at Oxford, Cambridge, and other centres, and to award certificates on the examination.

There are three kinds of certificate examination, for (i.) Higher certificate, (ii.) Lower certificate (first examination

July 1883), (iii.) Commercial certificate (first examination, July 1888).

(i.) *Higher Certificate.*—To obtain this the candidate must satisfy the examiners in four subjects, taken from not less than three of the following groups. (Distinction may be obtained in each subject except II. (1).)

Group I. (1) Latin, (2) Greek, (3) French, (4) German.

Group II. (1) Elementary, (2) Additional mathematics.

Group III. (1) Scripture knowledge, (2) English, (3) History.

Group IV. (1) Natural philosophy, mechanical division; (2) Natural philosophy, physical division; (3) Natural philosophy, chemical division; (4) Botany; (5) Physical geography and geology; (6) Biology.

In the case of girls, (1) The examination may be taken in two parts, the candidate being required to pass in two subjects at each examination. (2) A choice is given of three other subjects: *a.* Italian (Group I.), *b.* Drawing (II.), *c.* Music (IV.).

Fee, 2*l.*, or 1*l.* 10*s.* for candidates who hold a certificate.

(ii.) *Lower Certificate.*—A candidate must pass in five subjects, taken from not less than three groups, of which I. and II. are compulsory.

Group I. (1) Latin, (2) Greek, (3) French, (4) German.

Group II. (1) Arithmetic, (2) Additional mathematics.

Group III. (1) Scripture knowledge, (2) English, (3) English history, (4) Geography.

Group IV. (1) Chemistry, (2) Physics.

Geometrical drawing may be taken, but not as one of the five necessary subjects. Fee, 21*s.*, with extra fee of 10*s.* for a candidate examined away from his school.

(iii.) *Commercial Certificate.*—A candidate must pass in (1) at least one of the following: French, German, Italian, Spanish; (2) Arithmetic and algebra; (3) English and geography; (4) One of the following: (*a*) Latin, (*b*) English history, (*c*) Political economy, (*d*) Drawing, (*e*) Inorganic chemistry, (*f*) Organic chemistry, (*g*) Mechanics, (*h*) Electricity and magnetism, (*i*) Sound, light, and heat. Fee, 1*l.* 5*s.*, with an extra fee of 10*s.* for a candidate examined away from his school. There are two classes in each subject in both (ii.) and (iii.).

Statistics for 1887.—*Schools examined*: 73 boys', 38 girls' schools. *Higher certificate.*—Candidates, 992; certificates, 584. *Lower certificate.*—Candidates, 457; certificates, 273.

Cost of School Examination.—This varies with the standard of papers set and the size of classes examined. A set of higher certificate papers set to a class costs about 15*s.* per paper above the certificate fees if the boys or girls in the class are all candidates for certificates, and if the authorities of the school want the marks before the results of the certificate examination are published. The charge for examining lower forms decreases in proportion. 'Inspectional' papers, examined first by a master and inspected by the examiner, are charged at a lower rate. A reduction of one-third in the total charge is made, under certain conditions, to schools of less than 100. In the case of the lower and commercial certificate examination there is a charge of one guinea a day for a supervisor.

Exemptions.—The higher certificate exempts, under certain conditions, from responsions, the preliminary examination for Mus.Bac. at Oxford, the previous examination at Cambridge, the preliminary examinations of the Incorporated Law Society, the General Council of Medical Education, from parts of the examinations of the Royal Institute of British Architects, of the Surveyors' Institution, and from part of the examinations for Sandhurst and Woolwich. The lower certificate exempts, under certain conditions, from the preliminary examinations of the Pharmaceutical Society and of the Royal Military College, and of the General Council of Medical Education.

Application for school examinations should be made to one of the secretaries before February 15, and names of candidates for certificates sent in before May 20. Further information may be obtained from the Report of the Joint Board for 1886–7, and the Regulations for 1888 (Oxford: at the Clarendon Press, and at 116 High Street; Cambridge: at the University Press, and at Messrs. Deighton, Bell & Co., Trinity Street), and from the secretaries—E. J. Gross, M.A., Caius College, Cambridge, and P. E. Matheson, M.A., New College, Oxford.

P

Pansophic Method. *See* COMENIUS.

Parallel Classes.—There are both maximum and minimum limits to the number of pupils who can with advantage be placed together in one class, however skilful the teacher may be. Moreover, the number of grades or steps in a school should never be more than a normal pupil can ascend during his school life, without being unsettled by a too frequent and irregular promotion. Hence, in a school of any size, it is commonly found necessary to separate pupils of the same proficiency into two or more classes, and to reduce the number of grades by placing two or more classes in the school ladder upon the same level. These two considerations produce the same result; viz. that in certain parts of the school there are classes whose work is the same—which are *parallel* and not successive to one another. These are called '*parallel classes*.' The same thing also occurs in the lower stages of schools by no means large, when the newly entered pupils are too numerous for one class, and yet have shown so far no marked difference in proficiency.

Parallel Grammars.—The need for uniformity of method in dealing with the grammatical phenomena of different languages was early felt by educational reformers. Ratich (*q.v.*) enunciated the principle, 'Uniformity in all things, as well in the method of teaching as in the books, rules, &c.; so that the grammars of the various languages taught may be as far as possible harmonised.' Comenius (*q.v.*) held the same view: 'Let there be one and the same method for instructing in all tongues.' In more modern times several scholars of high repute have lent the authority of their names to this principle. For an eloquent appeal on behalf of uniformity the reader may be referred to the delightful work of Prof. D'Arcy Thompson called *Day Dreams of a Schoolmaster*. 'We still separate by arbitrary boundaries studies that we know, or should know, to be cognate. If Latin, Greek, and Teutonic are really sisters, and French a daughter of one of them, why should it be thought impossible to teach them all on some catholic plan? At the very least, the grammatical terms employed in one schoolroom might be employed in another. If a boy were called upon to parse such a sentence as "*I should like to know*," in three consecutive class-rooms, he would find a Conditional Mood in the French room, a Subjunctive one in the Latin, and an Optative one in the Greek. A very Proteus of a mood; now a bear, now crackling fire, now running water, that slips through one's fingers.'

The evils of anarchy in grammar are obviously of no slight magnitude. When the pupil finds terms used in different senses in different books, he either ceases to attach any meaning to them or bewilders himself in the attempt to reconcile what is irreconcilable: the result is that grammar appears to him to be an arbitrary puzzle, and his only safeguard seems to lie in keeping a separate compartment of his mind for the grammar of each separate language. To take a single example: what idea can a pupil attach to tense names, when he is presented with no less than five different names for the five forms *wrote*, *schrieb*, *scripsit*, *écrivit*, ἔγραψε, the use of which appears to him to be identical? In French it is *Definite*, in Greek *Indefinite* (ἀόριστος), in German (generally) *Imperfect*, in Latin *Perfect*, in English simply *Past* (or *Past Indefinite*). Were these names really distinctive of various shades of meaning in these forms, they might be justified on scientific grounds, if not from the point of view of teaching; but, as a matter of fact, the diversity depends, not on anything in the nature of the forms—though, of course, the scope of the Greek and French tenses is less wide than that of the English and German forms—but simply upon different points of view in the writers of grammars. Each name has sprung into existence from a desire to express some important aspect of a grammatical fact; but none has been dictated by consideration for the needs of other languages. These tense-names are in fact not adapted to be used side by side. Similar anarchy prevails in the nomenclature of cases and moods, and the parts of speech. Nor is this surprising. Our grammars are based upon systems derived from such different sources as Roman emperors, Stoic philosophers, the French

Academy, and English headmasters. Thus the term *Mood* is used in two quite different senses—sometimes denoting a distinct *form*, sometimes a certain class of sentences. Hence the term *Potential Mood*, which has not yet died out, in spite of Mr. Mason's vigorous protest against it. The description of the Subjunctive is very different in different books; in some it is the mood of *possibility* (Morris), in others the mood of *doubt* or *uncertainty*, in others the mood of *unreality*, in others the *thought* mood, in others the mood of *will* (Delbrück, Brugmann), as distinct from the Optative, or mood of *wish*. The pupil infers simply that it is the mood of *vagueness*. (Compare article GRAMMAR.) In the parts of speech the greatest confusion prevails. What is a pronoun in one grammar is an adjective or adjective-pronoun or pronominal adjective in another. The Public School Primer and many other grammars call all words like *quum*, *si*, *dum*, *ut*, 'Subordinate Conjunctions.' Mr. Roby, in his Latin Grammar, calls them all 'Connective Adverbs.' Mr. Mason, in his English Grammar, distinguishes the corresponding English words as: 1. Relative Adverbs (*when*, *where*, *as*, &c.), 2. Subordinate Conjunctions (*because*, *after*, *while*, *if*). The article is for the most part given up, as a separate part of speech, in enlightened English grammars, but still lingers on in French and German. When we come to the verbals (Verb-Nouns, Verb-Adjectives) we find that while English grammars adopt a scientific line of treatment, in French the gerund is, as a rule, not recognised at all; the pupil is told that in the phrase *en passant*, he has to deal with a participle (Verb-Adjective). In the analysis of the sentence we have much confusion. The term *sentence* denotes sometimes the expression of a 'complete thought' (i.e. a thought containing both subject and predicate) *by means of a finite verb*, sometimes the expression of 'a complete thought,' whether by means of a finite verb or not. Subordinate groups containing subject and predicate of their own are called sometimes *sentences* (adjectival sentences, &c.), sometimes *clauses* (adjectival clauses, &c.). The term *phrase* is used by most teachers of French as meaning *sentence*: in English grammars it denotes a group of words having the function of a single part of speech, and containing no finite verb. The simple sentence is analysed on different principles (*see* ANALYSIS OF SENTENCES); the varieties of the compound sentence are sometimes treated under one heading, sometimes under two headings (Compound and Complex sentences). The arrangement of the phenomena of syntax proceeds sometimes on the lines of accidence (this may be described as the old-fashioned method); sometimes on the basis of analysis. The latter method is followed by Mr. Mason and by Dr. Kennedy in the Public School Latin Grammar (partly, too, in the Public School Latin Primer). Teachers of modern languages, as a rule, prefer the old method; the new method is, at least partly, followed by most recent English grammars. These two schools of grammarians differ *toto cælo* in their views as to teaching syntax; the old method discusses the *uses of forms*, and arranges its matter under the headings of cases (nominative, accusative, &c.), moods (indicative, subjunctive, &c.). The new method may be called the method of sentences; it begins by classifying sentences and then asking how (i.e. by what *forms*) each kind is expressed. The first method aims at presenting in one place the whole doctrine of, say, the subjunctive mood, the other exhibits the unity of the *Subject*, the *Object*, the *Complement*; the *Statement*, the *Question*, the *Command*, &c. Neither system can be quite rigorously carried out in practice; but it is obvious that the order of syntax will differ in most vital points according as the one or other method is preferred. And it is clear that the pupil cannot be expected to translate grammatical facts from the one system to the other. Rules which might be expressed in identical terms for different languages are expressed in various and even contradictory terms. For example, a marked feature common to Aryan languages is the use of the Infinitive after certain verbs, e.g.: *I can write*, *ich kann schreiben*, *possum scribere*, *je puis écrire*, *δύναμαι γράφειν*, &c. In Latin, the pupil at many of our public schools is nowadays taught that the Infinitive is *Prolative*, i.e. 'carries out' the construction of the finite verb. In German, on the contrary, the finite verb is called *Auxiliary* to the Infinitive. Each mode of treatment is partially justified, neither expresses the whole truth. In Greek and French this use of the Infinitive is often not named at all; the rule simply speaks of '*the* Infinitive.' The

term *Complementary* is sometimes used. To determine which is the best term may be difficult; but any one employed consistently would be an improvement on the present state of things. Again, the sphere of the *Indirect Object* is ill defined. The Public School Primer treats not only the Dative after verbs of 'giving,' &c., but also the Dative after *faveo*, *parco*, *videor*, &c., and even that after adjectives, as Datives of the Indirect Object (though no Direct Object is expressed or understood in the latter case); others even treat the second Object after verbs of 'teaching,' &c., as an Indirect Object.

But, it may be asked, are not these incongruities in the grammars of different languages inevitable? No doubt the question is hedged round with difficulties; and the idea of uniformity must not be interpreted in a narrow spirit. If there are striking resemblances between the members of the Indo-European family—resemblances which have often been obscured by the current treatment in school books—there are also radical differences between the languages of Teutonic origin and those derived from Latin. To ignore them would be to do violence to the genius of the one or the other group.

But there are two considerations which may be of service in solving that problem: (*1*) If the method be adopted of laying down certain distinctions of thought, and then asking how each language expresses them, or whether it leaves them confused, a parallel treatment is quite possible. Such a method might very well be based on the analysis of sentences as now widely practised in English-speaking countries. It would be necessary to guard against the encroachment of mere logic upon the domain of grammar (*see* ANALYSIS OF SENTENCES); any revival of the attempt to deduce the laws of grammar from categories of thought would be an anachronism. It would be necessary to draw up a carefully selected list of constructions worth consideration and explanation, and to limit the grammars to them only. (2) Much advantage might come from making English the point of departure; parallel grammars for English schools should find a centre in a grammar of English. The other grammars would then have to provide an answer to the question: How far does the usage of a particular foreign language coincide with that of English, and in how far is it different? The advantage of such a treatment would be that it would illustrate the one language by the help of the other, and thus lead to clearer ideas about both. In current grammars it is often difficult to distinguish what is *common* to the two from what is a *special* feature of one of them. To quote the words of the *Great Didactic* of Comenius: 'Let the precepts of a new language be first known as differences from languages already known. . . . It is not only useless to teach what is common to a new language with one already acquired, but it is confusing and overwhelming.' Greek grammar may safely be treated in connection with Latin, because few people learn Greek first; but other languages ought to be based directly upon the mother-tongue.

At the present day there are many teachers who regard uniformity in the teaching of grammar as a not merely fanciful ideal, but one from which they expect great results; believing that the difficulties involved in applying the method may be overcome, and that grammar will then become a more useful instrument of teaching than it is at present. Several schools, both in England and America, have formulated schemes for use, and the results, so far obtained, are pronounced to be encouraging. In 1885 a society called the Grammatical Society was formed by a number of teachers representing all kinds of schools and colleges, with the express purpose of introducing uniformity of terminology into the teaching of English, Latin, French, German, and Greek (President, Rev. A. R. Vardy, M.A., Head Master of King Edward's School, Birmingham).

Paraphrase.—This term is not infrequently taken to signify an attempt to change the *wording* of a sentence or paragraph without changing its *meaning*. Such an attempt is not only in most cases entirely hopeless, but seldom or never has it any educational value—especially when the original is the work of a real artist in language. To change the wording *must*, to some extent, change the meaning—except, perhaps, as far as the substitution of modern for obsolete words is concerned—and *must* change or destroy the beauty of the passage. As a school term *paraphrase* should (and does generally) signify the expansion and *explicit* statement of all that is *implied* by the metaphors and

similes, references and associations, of a passage of prose or verse. Its educational value, in this sense, is considerable; for it is only by unravelling and carefully examining the material used by a skilled writer to produce his effect—be the material figure of speech or associations connected with the words, or even the cadence of the sentences—that we can learn to do likewise, or can give evidence that we understand and appreciate the passage set before us. By this process the passage is not disfigured or destroyed, but searchingly, clearly, and completely expounded.

Parsing. *See* ANALYSIS OF SENTENCES.

Pascal, Blaise. *See* JANSENISTS.

Pascal, Jacqueline (*b.* 1625, *d.* 1661), sister of the celebrated Blaise Pascal, achieved a considerable reputation in connection with the education of children at the institution at Port Royal des Champs. After the death of her father, Jacqueline, in January 1652, joined the Port Royalists as a *religieuse*, and next year assumed the name of Sœur Sainte-Euphémie. In 1655 she was appointed submistress of the novices, charged to conduct their education, and for the rest of her life remained at the head of that department. In this position she greatly distinguished herself. The principles she pursued in the education of her pupils she described in a special treatise entitled *Règlement des Ecoles de Filles de Port-Royal.* Among other things Sister Euphémie attempted to introduce an improved method of teaching reading, originally devised by her brother. In the first part of her *Règlement pour les Enfants* she gives a minute account of the method she pursued in the physical, mental, and religious education of her girls at Port Royal. The second part of the treatise is of most pedagogic interest. It describes the character and behaviour of the schoolmistress as she ought to be according to Catholic Jansenist ideas, and discusses the whole field of the management of children, the question of rewards and punishments, the course of reading, and the training of the moral character of pupils. However obsolete many of the special recommendations in this treatise, its general character is such as to extort our admiration for the authoress, as an example of lofty self-sacrifice and devotion to duty in the work of training the young. The suppression of the school, which was effected in April 1661, and the persecution to which the Port Royalists were subjected, chiefly through Jesuit jealousy, was a cruel blow to Sister Euphémie, and she died in October in the same year of a broken heart. (*See* JANSENISTS.)

Pauper Education.—The sixteenth Annual Report of the Local Government Board, June 1887 (Eyre and Spottiswoode, 3*s.* 9*d.*), showed that in our workhouses, workhouse schools, and district union schools, there were 55,472 children of the State, excluding 3,277 boarded out in private families. Of these 34,011 were 'orphans or other children relieved without their parents,' the latter phrase applying chiefly to children practically orphans, i.e. deserted by parents who cannot be found. Of the 55,472 children for whom the Poor Law provided education, 7,069 were in district schools, 24,583 were taught in workhouses and separate Poor Law schools other than district schools; the remainder were sent out to public elementary schools. There are four inspectors of Poor Law schools; 37,323*l.* was paid for teachers in the schools. This total has steadily decreased since 1882, owing to the increasing favour with which boards of guardians look upon the plan of sending their children out to school instead of keeping them night and day in the same atmosphere and environment. In 266 of the 647, i.e. 41 per cent. of the unions, the children are now (1888) sent out to public elementary schools; in 271 they are taught in the workhouse (but 12 of these unions send some of the children out); in 58 they are taught in detached or separate schools other than district schools; in 31 cases they are sent to district schools; and in 21 they (being few) are sent to the schools of another union.

Public attention has been of late years much directed to the inadvisability of keeping children in pauper establishments, whereby the pauper taint and characteristics are, it is urged, inevitably created, especially in the case of girls. Mr. Nassau Senior (whose works should be consulted) was perhaps the pioneer in this direction, and public opinion has been enlightened and directed also by the labours of the Metropolitan Association for Befriending Young Servants (15 Buckingham Street, Adelphi, W.C.); the Association for Promoting the Boarding out of Pauper Children (Miss W. Hall, Devonshire Place, Eastbourne, hon. sec.); Miss Ellice Hopkins (Percy

House, Brighton) and her Ladies' Associations for Befriending Friendless Girls; Mr. F. Peek's *Social Wreckage*; and the work of the Church of England Society for Providing Homes for Waifs and Strays (32 Charing Cross, S.W.), and others.

It is widely admitted that the old plan of keeping children and adults together in workhouses is thoroughly bad, and not to be thought of, except when parents accompany their children and are probably only in for a short time. Separate schools and district schools are also open to many objections, as ingraining pauperism by keeping and training children apart from any healthy contact with the outside world. The huge district schools, chiefly metropolitan, wherein 600 children may be barracked together, are found to produce most evil results, from moral, economical, and social points of view. On the other hand, it has been argued that to keep down pauperism the pauper stigma must be kept on the children. Our colonies at first naturally copied the English Poor Law system, but have discovered its faults. Several Australian colonies now have no State children in any State institution of the workhouse-school type.

Good may be done by sending the children out to mingle in a National or Board school with others whose lot is more happy and life more natural. In Leeds this is not only done, but the ordinary pauper uniform is discarded. But the depauperisation of children may best be effected in the following ways, all of which are being increasingly adopted: (1) By boarding out all orphan and deserted children of tender years with foster-parents, under certified committees of ladies in the country. This is the most economical, as well as the best plan, and has for many years been thoroughly worked in Scotland, Ireland, our colonies, and in fact nearly every country except England. In 1888 our 647 boards only thus benefited 1,172 children, i.e. not two per board. (2) The children are placed with foster-parents, but within the limits of the union to which they belong, and are inspected by the relieving officers and guardians. There were 2,105 thus placed out in 1888. This is really only a kind of out-door relief, preferable, however, to keeping the children in the workhouse, or destroying their individuality and depriving them of home education in a district school. (3) Placing elder children, especially girls, in voluntary homes or industrial schools established and managed by private individuals. The Waifs and Strays Society had in 1888 six of this kind certified and inspected by the Local Government Board, besides others affiliated to it. In the same year there were 143 of such schools in England and Wales. (4) By emigration to Canada under the special care of private persons or philanthropic societies—e.g. the Waifs and Strays Society—who are recognised by the Local Government Board. Great care is here necessary in the selection of children. Canada readily distinguishes between a workhouse or institution child and one who has had the more natural training of a small home, and it is desirable for guardians to send to such homes for at least six months those whom they wish to emigrate. Emigration costs about 10*l*., or about one-third of the cost for one year of a child in some of our district schools. Yet only 166 were emigrated in 1886. The emigration officers of the Canadian Department of Agriculture now report to the Local Government Board the results of their inspection of the children placed out, and these reports are described as 'generally satisfactory.' The Board prefer girls to be under ten years old. It is generally believed that if these four plans were more commonly adopted the number of children reared as paupers would very rapidly diminish, the saving to the rates would be great, and the gain to the health and wealth of the State greater still.

In this article distinctions are assumed between paupers and the indigent poor. The education of the poor and their children involves questions merging in various articles on primary and State education (*see* articles RAGGED SCHOOLS, WAIFS AND STRAYS, VACATION SCHOOLS, ROYAL COMMISSIONS). The National Society (Sanctuary, Westminster, S.W.) is the recognised handmaid of the Church of England for promoting the education of the poor in distinctive religious principles. By means of the offerings of Churchmen it did a great work for the nation before School Boards were thought of. Between 1811 and 1886 it spent 1,191,000*l*. voluntarily contributed by Churchmen, the largest item, 586,800*l*., being on schoolhouses. It publishes weekly the *School Guardian*. Since the Government ceased to inspect in religious subjects *Diocesan Inspectors* of schools have been appointed for these

schools. The education of the poor is also fostered by the following organisations, chiefly by grants of books and apparatus both to teachers, pupils, school and parish libraries, missions, &c. Details are sent to teachers and managers on application. Society for Promoting Christian Knowledge (Northumberland Avenue, Charing Cross, S.W.); Religious Tract Society (56 Paternoster Row, E.C.); Pure Literature Society (11 Buckingham Street, Strand, W.C.); Church of England Book Society (11 Adam Street, W.C.); Book Hawking Association (hon. sec. Rev. P. Lilly, Collaton St. Mary, Paignton, Devon; depôt, 190 Oxford Street, W.). The S.P.C.K. is publishing a new *Penny Library of Fiction*, also *Parish Magazine*, *Dawn of Day* (200,000 monthly), *Home Words*, *Day of Days*, &c. Among other parochial magazines are the *Gospeller*, *Things New and Old*, the *Evangelist*, and the *Banner of Faith*. There are other good magazines issued by the various Sunday school organisations.

There are two broad questions connected with pauper education which are subjects of controversy. They involve problems of (1) localisation, (2) distribution. That is: (i.) Are pauper children to be treated as the children of the State or of a small local community? (ii.) Are the children to be massed together or distributed in small homes here or in the colonies? The first question has been answered in England since the days of Elizabeth by the Poor Law system, which may almost be called the eldest daughter of Protestant Christianity (see Fowle's *Poor Law*, Macmillan's *English Citizen* series, 2*s.* 6*d.*). We see in fact that Church provision preceded State provision. This is still the case, although the unity of Church and State (purporting to act for the benefit of the nation) is not as marked now as it was in the early days of the poor laws. We have now arrived at an age of great cities, when about half the total population of England are crowded into the towns, as contrasted with about one tenth even in India. Hence new difficulties. For the efficiency of the present system depends too much upon the varying characters of local boards, and the comparative breakdown of their system in dealing with pauper children in the great cities has led to the great increase of supplementary methods during Victoria's reign. It is not unnatural for local boards to regard the children as burdens, to be disposed of as soon as possible. They have therefore sometimes to be watched, say, by State officials, who see that a labour proficiency certificate is properly granted. The child, it is also argued, is liable to be turned out less able to resist the pauper taint, and more likely to become a burden in the workhouse. It is therefore proposed by some that the children should not be treated as those of a locality, but as those of a nation. The second question is now being keenly discussed. It is often referred to as the 'barracks' *versus* the 'boarding-out' system. Instead of being kept in the workhouse or industrial school, children are now placed with widows and families who are paid to bring them up. The average cost of children is about 5*s.* a week. The controversy among boards of guardians often turns upon the relative cost, rather than the efficiency either to the children or the State. Some of the guardians are making experiments in migration to other parts of the empire. The bright side of the large school system is the regular and constant occupation of the mind, and a discipline which ensures both order and general comfort. In a cottage home the discipline may or may not exist, but it is urged that the girls are more likely to be better trained as domestic servants than in the schools. The children are, it is complained, too much shut out of the world. The children become weary of the monotony and the walls. In large towns, if they are let out for a few hours weekly, there is the danger of their bringing infection to the school, but this and other difficulties could probably be overcome. The 'moral' difficulties exist in both cases, and are not entirely dependent on the tone or watchfulness of school or home. Teachers and friends may do much by visiting the children by arrangement with the master or mistress, giving simple lectures, experiments, pictures, asking questions, and thus showing personal sympathy with the children and teachers. Ladies and gentlemen of leisure can still do a great work in this direction. The assistant-teachers need encouragement and sympathy; for it must be remembered that the nature of the inspection system is essentially a spy system, and the fact that assistants and chaplains are appointed

and dismissed by the Board, not by the master as in public schools, encourages suspicion and selfishness. Annual treats and yearly kind words are not enough; moreover, Christmas remembrances are never overwhelming, as they are sometimes said to be in infirmaries or orphanages.

There is, lastly, the great difficulty of parental control. Ought dissolute and unworthy parents to have the legal control of their children? If not, would measures with the children offer a premium to such parentage? It is impossible to punish the *un*worthy parents *through* their children. We seem to have other questions also being put, e.g. Is it the duty of the State or the community to find work for the unemployed of any age? Is idleness a sin or a crime, or both?

Payment by Results.—The origin of the controversy which has stirred to its very depths that portion of the education world which is interested in public elementary education dates from the year 1861, when the Committee of Council, under the Vice-Presidency of Mr. Robert Lowe (Lord Sherbrooke), framed and presented to Parliament the *Revised Code* of Minutes and Regulations for the future distribution of the parliamentary grant. By that code—which followed in this particular the recommendations of the Royal Commission on Popular Education, which had sat since 1858—grants were for the first time to be apportioned to schools, in part, on the results of the *individual* examination of the scholars. This is what is meant by 'payment by results.' This principle, thus introduced, was not rendered any the more palatable to the body of teachers in public elementary schools, by the grounds upon which Mr. Robert Lowe recommended its acceptance to the country. In his speech in the House of Commons on February 14, 1882, he used the following words: 'It seems to me that the only possible conditions under which, without a reckless expenditure of public money, we can possibly recommend that teachers of an inferior class should be employed in these schools, would be on the understanding that there shall be some collateral and independent proof that such teachers do their duty;' and he proceeded to show that that proof could only be obtained by *individual* examination of the scholars, and to recommend that a sensible portion of the grant should depend on that examination. He dwelt, too, on the vague nature of a report based on examination by classes, and described such terms as 'general efficiency,' 'general impression on the whole,' 'moral atmosphere,' &c., in inspectors' reports, as 'impalpable essences,' which it was not wise for Parliament to treat as substantial tests that its money was well spent. It was natural that the tone of this reference to the elementary teachers, and the implication that they would not rise to the level of their duty as conceived by the nation, except under the pressure of the *argumentum ad crumenam*, should cause the deepest offence. A bitterness has, therefore, been imported into this controversy that is only intelligible when this episode is borne in mind. But experience has shown that, on purely educational grounds, the principle of 'payment by results' has worked considerable mischief. No doubt it has remedied the evil it was called into working to remedy. The charge brought against previous codes was that they encouraged the teachers to pay attention to the regular, the bright, the well-to-do scholar, and to neglect the irregular, the dullard, and the poor scholar and that the utterly ignorant were left in their ignorance. But 'payment by results' is charged with introducing other great evils, which were not wholly unforeseen, and which have more than fulfilled the forebodings of practical educationists. These evils may be summarised as follows:—*a.* It has organised a system of cram, under which 'results,' measured by the standard examinations (*see* STANDARDS), as opposed to 'methods,' have received undue recognition and reward. *b.* *All* scholars, whether clever or dullards, progress at the same rate—one standard per annum; and at the same rate in all subjects simultaneously. *c.* The degree of success, with neglect, incapacity, and the bad influences of home surroundings, meets with little recognition as compared with the success in 'passing' a high percentage of scholars. *d.* The profession of the teacher is degraded by persistent and obtrusive appeals to the desire of gain. In the absence of monetary inducements, teachers are tempted to neglect scholars who are not likely to earn good grants. *e.* Little encouragement is given to teachers to forward the higher moral and intellectual training of their scholars, as opposed

to the mere acquisition of mechanical facilities in the subjects of examination. *f.* Scholars trained under this system, and subsequently passing on to secondary schools, are characterised by a lack of mental alertness, and frequently disappoint their early promise. The bad effects brought to light in the practical working of this principle have forcibly stirred many of the succeeding Vice-Presidents of the Committee of Council to retrace, in part at least, the steps which the Royal Commission of 1858 and Mr. Lowe prevailed upon Parliament to take in 1862. During the period of his vice-presidency, Mr. Mundella consulted the leading advisers of the Education Department and other educationists, and presented a body of recommendations to Parliament which were adopted in subsequent codes, and have, though only partially, remedied the evils inveighed against. Of these, what is known as the 'Merit Grant' is the most conspicuous. This grant consists (*see* CODE) of a payment of 1*s.*, 2*s.*, or 3*s.* per scholar in average attendance—according as a school is reported to be fair, good, or excellent. The following extract from the Instructions to H.M. Inspectors pointing out what, in the opinion of the Education Department, should be the attributes of a school deserving of the 'excellent' Merit Grant, will show how much may be done under its provisions to counteract the evil effects of the principle of 'payment by results.' The principle itself, however, has at most been 'scotched' thereby, not killed. Extract from Instructions:—

'It is the intention of their Lordships that the mark "Excellent" should be reserved for cases of distinguished merit. A thoroughly good school in favourable conditions is characterised by cheerful and yet exact discipline, maintained without harshness, and without noisy demonstration of authority. Its premises are cleanly and well-ordered; its time-table provides a proper variety of mental enjoyment and of physical exercises; its organisation is such as to distribute the teaching power judiciously, and to secure for every scholar —whether he is likely to bring credit to the school by examination or not—a fair share of instruction and of attention. The teaching is animated and interesting, and yet thorough and accurate. The reading is fluent, careful, and expressive, and the children are helped by questioning and explanation to follow the meaning of what they read. Arithmetic is so taught as to enable the scholars not only to obtain correct answers to sums, but also to understand the reason of the processes employed. If higher subjects are attempted, the lessons are not confined to memory work and to the learning of technical terms, but are designed to give a clear knowledge of facts, and to train the learner in the practice of thinking and observing. Besides fulfilling all these conditions, which are all expressed or implied in the Code, such a school seeks by other means to be of service to the children who attend it. It provides for the upper classes a regular system of home-exercises, and arrangements for correcting them expeditiously and thoroughly. Where circumstances permit, it has also its lending library, its savings bank, and an orderly collection of simple objects and apparatus adapted to illustrate the school lessons, and formed in part by the co-operation of the scholars themselves. Above all, its teaching and discipline are such as to exert a right influence on the manners, the conduct, and the character of the children, to awaken in them a love of reading, and such an interest in their own mental improvement as may reasonably be expected to last beyond the period of school life.' The system of payment by results has not been adopted in any country outside the British Isles except the Province of Victoria, Australia, and even there its evils are now fully recognised by the authorities.

Payne, Joseph (1808–1876).—A theoretical and practical educator, and teacher of teachers, of whom it was said in the *Educational Times* for June 1, 1876, just over a month after his decease, that 'it would be difficult to over-estimate the loss which the cause of educational progress and reform has sustained by the recent death of Mr. Joseph Payne. At the present juncture, when so great an impetus has been given to popular education, and such rapid strides are being taken, not always with the clearest light or in the wisest direction, and when the guidance and influence of men of wide experience, careful thought, and untiring devotion is more than ever necessary, few could be named whose place it would be more difficult to supply.'

The business of Mr. Payne's life was to make education a reality rather than a

pretence; and with this purpose in view he exposed the futility of the unintelligent routine with which educators have too commonly contented themselves, and sought to rouse them to substitute for it methods which would call the expanding faculties of the young into healthful activity, and sympathetically guide them in the course of their development to the best and wisest ends. The only teaching which he regarded as worthy of the name was that which imparted the power of self-teaching; and, whilst awakening in the learner a desire for knowledge, guided him by the surest and readiest means to its attainment. In order to carry out the intelligent and scientific principles which are essential to the achievement of such a result, it was necessary that the teacher must learn how to teach—must have acquired, that is, not only a thorough knowledge of the subject to be taught, but of the laws which govern the exercise and development of the faculties of those whom he teaches. He must know, indeed, both the lesson and the scholar, and the means by which the two may be brought into edifying and fruitful contact. 'These aims Mr. Payne pursued throughout his life, unobtrusively indeed, yet with single-minded enthusiasm, and unswerving tenacity of purpose.'

Joseph Payne was born at Bury St. Edmunds, on May 2, 1808. His early education was very incomplete, and after a short experience, which commenced when he was about fourteen years of age, of really competent instruction, he was early thrown on his own resources for procuring a livelihood. He became an assistant in a London school; and, as he himself maintained, he would have fallen into the ordinary groove of routine teaching if he had not accidentally become acquainted with the principles of the French reformer Jacotot, and been fired with the enthusiasm which Jacotot succeeded in kindling far and wide, both in his own country and in Belgium. In England Mr. Payne was the first (in importance, if not in time) of the disciples of Jacotot, of whom he always spoke as 'his master;' and, finding that the new principles entirely changed his notions of the teacher's office, and turned routine into a course of never-ending experiment and discovery, he forthwith set about preaching the new educational doctrine. Though a very young man, and with small resources, he published his earliest educational essay, which was indeed his earliest published work on any subject, on the *Principles and Practice of Professor Jacotot's System of Education*, 1830; and gave public lectures to arouse teachers to a sense of its importance. The system interested a lady, the wife of Mr. David Fletcher, of Camberwell, who induced Mr. Payne to undertake the instruction of her own children; and from the circumstance that the children of one or two neighbours were admitted to the benefits of his teaching, a small preparatory school sprang up, which afterwards expanded into the important institution known as Denmark Hill Grammar School, where, with Mr. Fletcher as his partner, he continued his labours for many years.

In 1837 Mr. Payne married Miss Dyer, who was at the head of a girls' school of high repute, which she continued to carry on for some time. She was a lady of great tact and energy of character, of approved skill and method in the conduct of affairs, and in perfect accord and sympathy with the educational aims and ambitions of her husband, whom she greatly assisted, not only in his school-keeping, but in all his undertakings, his studies, even, included.

Mr. Payne's connection with the school at Camberwell continued till the year 1845, when he established himself independently at the Mansion House, Leatherhead, Surrey. Here he laboured with great energy and success for about eighteen years, his school taking rank as one of the very first private schools in this country. In 1863, having acquired a modest competence, he retired from the active duties of his profession. None the less, however, did he continue to devote himself strenuously to the cause of educational progress; and his career offers a striking exception to that law of the decay of enthusiasms in virtue of which they generally retrograde as age advances. When, after between thirty and forty years of honourable labour in his vocation, he found himself free to spend his remaining days as he chose, he set to work with an ardour and energy and self-devotion rarely found even in young men to arouse teachers to a sense of their deficiencies, and to be a pioneer in the needed science of education. It was, it is believed, mainly owing to his influence and to that of his friend, Mr. C. H. Lake, that the College of Preceptors instituted

an examination for teachers—the first held in this country. In 1873 the College took another important step, and appointed the first English Professor of the Science and Art of Education, their choice falling unanimously upon Mr. Payne, than whom no man could have been found with higher qualifications. He had always been a hard student; and, till but a few months before his death, he was wont to continue his work into the small hours of the morning. He had thus a wider culture than is usually found in schoolmasters, or, indeed, in any class of hard-worked men, and his habits of reading and writing gave him great advantages as the occupant of the newly-instituted chair, which he further illustrated by his profound belief in the present value and the future possibilities of the science of education. No work could have been more congenial to him than endeavouring to awaken in young teachers that spirit of enquiry into principles which he had found the salt of his own life in the schoolroom. And, short as his tenure of the professorship unhappily proved, he succeeded in his endeavour; and left behind him students who have learnt from him to make their practice as teachers more beneficial to others, and infinitely more pleasurable to themselves, by investigating the theory which not only explains right practice, but also points out the way to it.

The meaning of the word 'teacher,' as usually understood of one who communicates knowledge, was unsatisfactory to Jacotot and to his English disciple. What is knowledge but the abiding result of some action of the mind? Whoever causes the minds of pupils to take the necessary action teaches the pupils, and this is the only kind of teaching which Mr. Payne would hear of; thus the paradox of Jacotot, that a teacher who understood his business could 'teach what he did not know,' was seen to point to a new conception of the teacher's function. The teacher is not one who 'tells,' but one who sets the learner's mind to work, directs it, and regulates its rate of advance. In order to 'tell,' one needs nothing beyond a form of words which the pupils may reproduce with or without comprehension. But to 'teach,' in Payne's sense of the word, a vast deal more was required: an insight into the working of the pupil's mind, a power of calling its activities into play and of directing them to the needful exercise, a perception of results, and a knowledge how to render those results permanent. 'Such,' to quote the *ipsissima verba* of his friend, the Rev. R. H. Quick, 'was Mr. Payne's notion of the teacher's office, and this notion lies at the root of all that he said and wrote about instruction. It would be useless to attempt to decide how far the conception was original with him. "Everything reasonable has been thought already," says Goethe. Mr. Payne, as we have seen, was always eager to declare his obligations to Jacotot. The same notion of the teacher is found in the utterances of other men, especially of Pestalozzi and Fröbel. But when such a conception becomes part and parcel of a mind like Mr. Payne's, it forthwith becomes a fresh force, and its influence spreads to others.'

Mr. Payne took a lively and active interest in several of the most important movements, the purposes of which were identical or kindred with his own; such, for instance, as the Women's Education Union, and the Girls' Public School Company, the improvement of women's education having long been one of his most cherished objects. He studied profoundly the methods and systems of all who have obtained celebrity as educators, and the Kindergarten system of Fröbel was one in which he took a keen interest. He was especially interested in the history of the development of the English language, and the characteristics of the different dialects; and more particularly in the history of the Norman-French element. This led him to a rather extensive study of the dialects of French, and the history of the French language generally. A paper of great value by him on these subjects, entitled 'The Norman Element in the Spoken and Written English of the 12th, 13th, and 14th Centuries, and in our Provincial Dialects,' appears in the *Transactions of the Philological Society*, 1868–9, of which he was a distinguished and an active member.

As in the beginning of his career Mr. Payne was not deterred from his special vocation by the labour to which he was compelled, or by the privations from which he was not altogether free, so towards its close the same vocation was fulfilled with dignity, and with so much tenacity as could co-exist with the suffering or other disability he was called upon to endure. The death of his wife, which

occurred in the autumn of 1875, is believed to have aggravated the symptoms of a malady of some standing, which terminated on April 30, 1876, a life of singular purity and nobleness of aim, of strenuous and unintermitting industry, and of unselfish devotion to high and worthy ends. By his will Mr. Payne bequeathed a sum of money to the Endowment Fund, and a valuable library of educational books, which he had been for some years collecting, to the College of Preceptors.

Having regard to the assiduous and exacting labour demanded of Mr. Payne during so large a portion of his life, it may be said, on the whole, to have been one of not inconsiderable literary productiveness. His works comprise, besides the exposition of Jacotot's system already mentioned, *Epitome Historiæ Sacræ: a Latin Reading-book on Jacotot's System*, 1830; *Select Poetry for Children*, 1839 (eighteenth edition, 1874); *Studies in English Poetry*, 1845 (eighth edition, 1881); *Studies in English Prose*, 1868 (second edition, 1881); *The Curriculum of Modern Education*, 1866; *Three Lectures on the Science and Art of Education, delivered at the College of Preceptors in* 1871; 'Theories of Teaching, with their corresponding Practice,' and 'On the Importance and Necessity of Improving our Ordinary Methods of School Instruction,' in the *Proceedings of the Social Science Association*, respectively for 1868–69 and 1871–72; *The Importance of the Training of the Teacher*, 1873; *The True Foundation of Science Teaching*, 1873; *The Science and Art of Education: an Introductory Lecture*, 1874, and *Pestalozzi*, 1875, both of them being lectures delivered at the College of Preceptors; *Fröbel and the Kindergarten System*, 1874 (third edition, 1876); and articles in the *British Quarterly Review*, respectively on 'Eton,' 1867, 'Education in the United States,' 1868, and 'The Higher Education of the United States,' 1870. *A Visit to German Schools in the Autumn of* 1874 was published after the author's death in 1876; and a first volume of his *Works* was published, first and second edition, 1883, with the title of *Lectures on the Science and Art of Education, with other Lectures and Essays.* By the late Joseph Payne, the First Professor of the Science and Art of Education in the College of Preceptors, London. Edited by his son, Joseph Frank Payne, M.D., Fellow of Magdalen College, Oxford. With an Introduction by the Rev. R. H. Quick, M.A., Trin. Coll., Camb., Author of 'Essays on Educational Reformers.' The lectures and pamphlets included in this volume relate chiefly to the theory and science of education, and form the greater part of Mr. Payne's papers on educational subjects.

Pedagogue. *See* ROMAN EDUCATION.

Pedagogy.—This word has hardly taken root in our language. It has existed there at least since the time of Anthony Wood in the seventeenth century. And yet even now it is looked upon as something of an intruding foreigner. The contemptuous use of 'pedagogue' has perhaps been unfavourable to its acceptance; perhaps too the *word* meets with grudging recognition because the *thing* expressed by it is not held in much honour among us English. What then is the thing expressed? Let us say that it is a study whose end is to ascertain how the faculties of the young develop, and the best methods of harmonising educational arrangements with their development. Thus its interest is twofold, speculative and practical. This interest, however, is but little realised among us here in England, just because the two functions, the speculative and the practical, have been divorced from each other. The writers, such as Milton, Locke, and Herbert Spencer, have been too absolutely hostile to the existing order of things to gain a hearing from the teachers. The teachers have been too much of practical trainers, too little of thoughtful educators, to concern themselves with pedagogic theories. The books of celebrities, such as those just named, have been read because of the interest attaching to anything that proceeded from their pens, and not because of the educational stimulus that might be derived from their doctrines. But books on pedagogy, even when supported by names such as these, receive none too much attention, as may be learnt from the prefaces prefixed to Milton's and Locke's treatises in the Pitt Press editions. Herbert Spencer's work, it must be admitted, has been very widely read and discussed, yet in this case the separation between the educational theorist and the practical educator is only too forcibly illustrated. Spencer estimates the relative merits of the manifold subjects that claim a place in our educational course. And the suggestiveness of his estimate in

the abstract cannot be overrated. But one most important consideration is altogether left out of sight. Instruction is in the main carried on in schools; the most educative subjects under the class system that is inseparable from school life are those which best lend themselves to the catechetical (may we not dignify it by the name Socratic?) method. But Spencer, regarding the whole subject from a too purely philosophic and absolute point of view, has entirely omitted this factor from his account. The learner's aptitudes and his needs, and the intrinsic value of the subject, have been treated in a most masterly manner; but the conditions under which the learner is to study these subjects have hardly been regarded at all. Thus the defender of linguistic studies, as against those advocated by Spencer, has had left him by his mighty assailant one very strong fortress. He may plead that the question whether the instruction is to be imparted to learners individually, or to learners gathered together in large classes, is preliminary and fundamental. Readers of Milton and Locke will remember that the school system, whose claims, it is true, have very much increased in importance as the population has grown, is with them, too, either actually attacked or nearly disregarded. If, however, the educational theorist has been too little in touch with the practical educator, the latter has been far too little regardful of pedagogy—of the teaching of the educational thinker. The evidence for this statement is not far to seek. Books dealing with the theory and practice of education, books on pedagogy, by no means meet with as much public favour in this country as might be expected. One reason for this state of things is no doubt to be found in the fact that so many teachers in England have merely been drifted by force of circumstances into the occupation. Where men on the Continent *choose* teaching as a *profession*, we in England *accept* it as a convenient avocation that requires no preliminary outlay. Hence in France (to say nothing of Germany) a book like Compayré's *Histoire Critique des Doctrines de l'Éducation* passes through many editions, while similar books in England, if they find the light of day at all, certainly meet with nothing like general appreciation. The teachers elsewhere form a profession, and treat the subjects connected with that profession as a serious study; the teachers here form a heterogeneous assemblage, with or without credentials for the work in which they are engaged, frequently so guiltless of all educational theories as to be ignorant that they are ignorant. No wonder, then, that pedagogy is with us at a discount. This is unquestionably a most grievous national loss. 'Opinion is knowledge in the making.' Without something like scientific discussion on educational subjects, without pedagogy, we shall never obtain a body of organised opinion on education. But true theory and sound practice are too nearly related ever to be separated with safety. Thus our practice ignores much of what has been laid down as fundamental by writers on education. The difference between the *child* and the *youth*, so strongly emphasised by writers like Rousseau and Pestalozzi, is ignored all through our educational system, from the public elementary schools to the great public schools (*see* Quick's concluding remarks on Rousseau's *Émile*). For want, again, of such organised opinion, it has been in vain that Matthew Arnold has year after year pleaded for systematising Middle Class Education, and correlating it with the public elementary school system. (*See* article on Schools in Humphry Ward's *Reign of Queen Victoria.*) How indeed can our institutions be conducted on broad and healthy principles as long as so little consideration is devoted to the doctrines and theories of which they are the practical embodiments?

Pedagogy (Bibliography of). *See* Appendix.

Pedagogy (History of). *See* SCHOOLS OF ANTIQUITY; MIDDLE AGES (SCHOOLS OF); RENAISSANCE; REFORMATION; and the biographical articles.

Pedantry.—Pedantry is an ostentation of learning. It was a remark of Browne's, 'Tis a practice that savours much of pedantry, a reserve of puerility which we have not shaken off from school.' Swift was of opinion that pedantry is the overrating of any kind of knowledge we pretend to. For which reason Swift looked upon fiddlers, dancing masters, heralds, masters of ceremonies, &c., to be greater pedants than Lipsius or the elder Scaliger. According to Addison, a pedant is a man who has been brought up among books, and is able to talk of nothing else, and is a very indifferent companion; but he added that the title should be enlarged, for 'in

short, a mere courtier, a mere soldier, a mere scholar, a mere anything, is an insipid pedantic character, and equally ridiculous.' Bishop Burnet (*History of his own Times*, bk. ii.) speaks likewise of the pedantry of which the preaching of the clergy of the orthodox school was overrun before the rise of that intellectual and genial body of men, the latitudinarian divines.

Penitence, Remorse.—The state of mind indicated by these terms forms the characteristic pain of conscience or the self-judging moral faculty (*see* MORAL SENSE), just as the sense of well-doing or merit constitutes its proper pleasure. Remorse springs out of an inner act of self-reflection. It is the condemnation by the present self of the past self, and is thus a sign of, and indeed an important element in, moral progress. As might be expected from its conditions, remorse does not show itself in the first years of life. Hence the fact, which is apt to seem so baffling to the parent or teacher, that one cannot produce the state of mind by mere force of exhortation. Refusal to confess regret for a fault may arise from inability to fix the thoughts on the wrong action so as to see its true quality, from the persistence of the bad feeling which prompted it, or, lastly, from obstinacy. As repentance is thus a state of feeling which cannot be externally induced, it is well not to try to force it by mere talking, but rather to put the child in such circumstances as are likely to foster reflection. The manifestation of pain and disappointment by a parent or teacher whom the child really loves will often effect more in this direction than hours of admonition.

Penmanship. *See* WRITING.

Perception, Observation.—By the act of perception is meant the work of the mind in unifying the impressions received through the senses into a knowledge of objects. Perception is the first stage in that intellectual elaboration of sense-materials which culminates in abstract thought. To perceive, i.e. distinguish and recognise objects, implies normal and trained senses. When sense-impressions are indistinct the knowledge of things will be inexact. But it implies more than this, viz. the interpretation of the impressions received at the moment by the aid of past experiences. Thus, a child that sees its ball as a real object is translating visual impressions into imagined tactile experiences (feeling, lifting, rolling the ball). Hence perception is acquired. An infant does not see things as things, and cannot distinguish by the eye a flat drawing from a solid body. The ordinary circumstances and needs of life compel every child to connect and interpret its impressions up to a certain point. But such spontaneous acts of perception are apt to be rough and defective. The ends of exact knowledge require a more careful and systematic inspection of objects. This is marked off as Observation, and the branch of intellectual discipline that aims at securing it is known as the training of the Observing Faculty. To observe any common object, as a flint or a tree trunk, so as to note all its peculiarities of form, colour, &c., implies a strong, wide interest in objects. This the child has in a measure, and when the observing faculty has been drawn out from the first, the pleasure springing from the use of the organs of sense and from the gaining of new knowledge may be counted on as a sufficient motive. A habit of observation presupposes both presence and openness of mind; in other words, freedom from mental preoccupation and reverie, and a willingness to see things just as they are, and not as we fancy them or would like them to be. The highest kind of observation combines exactness or minuteness, comprehensiveness, and rapidity. The close connection between exact observation and scientific induction renders it important to exercise the observing faculty by object-lessons as a preparation for science-teaching. Observation forms, however, the necessary preliminary to all studies, e.g. geography, mathematics, language (cf. article SENSES). *See* H. Spencer, *Principles of Psychology*, vol. ii. pt. vi. chap. ix., &c.; Taine, on *Intelligence*, pt. ii. bk. ii. chap. ii.; Sully, *Teacher's Handbook*, chap. viii.; Thring, *Theory and Practice of Teaching*, pt. i. chap. vii.; Beneke, *Erziehungs- und Unterrichtslehre*, § 16, and following; Compayré, *Cours de Péd.*, pt. i. leç. iv.; and Buisson's *Dictionnaire de Péd.*, art. 'Observation.'

Peripatetic (*περιπατητικός*, from *περιπατέω*, to walk about).—A follower of the method of Aristotle, who taught and discussed with his pupils as he walked about amongst them in the halls and promenades of the Lyceum.

Perseverance.—This is that quality of

will by which an end is steadfastly pursued to the disregard of all extraneous solicitations. It is closely connected with mental concentration on a subject of thought (*see* ATTENTION); and it may be said indeed to be a firm concentration of the mind on an object of desire. The moral value of this quality as one of the highest manifestations of will, and its great practical utility in life, render it incumbent on the moral educator to develop it to the utmost. It is, moreover, a moral quality which the discipline of school is peculiarly well fitted to foster and strengthen. The learner should be led to see how success in study depends on perseverance, and how often, as the fable of the hare and the tortoise tells us, patient and unremitting effort defeats mere superiority of natural talent.

Persian Education, according to Herodotus (book i. 136), consisted in teaching youth to ride, to shoot, and speak the truth. (*See* SCHOOLS OF ANTIQUITY.)

Pestalozzi, Johan Heinrich (1746–1827), the son of a doctor of Zurich, and born in that town, was (with the exception of Froebel) the greatest educational reformer since the days of the Revival of Learning. His single influence has done more to humanise and render wise and sound the public elementary education, not only of Switzerland, but of all Europe, than that of any other man who has ever lived. Not that his reforms have ever been in any sense fully carried out; but that by him men's minds have been drawn to and fastened on the need of education for the people, and have been considerably enlightened as to what that education should be. The modern enthusiasm for what is called technical education is moreover, in a large measure, due to his teaching; and as time goes on, his views, mingling with those of his great follower Froebel, are year by year more and more changing and moulding the education of the earlier years of childhood.

For a detailed account of his life we must refer our readers to the excellent *Histoire de Pestalozzi*, by Roger de Guimps. Here, after mentioning a few of the most marked events, we shall restrict ourselves to a statement of his principles and practice. Pestalozzi commences his agricultural experiment at Neuhof near Birr in 1768—which ends in utter failure in 1780. Marries Anna Schultess in 1769. Experiment in educating pauper children at Neuhof, 1775–1780. Experiment in educating destitute children in the ruined Ursuline convent at Stanz during the first six months of 1799. Teaches in the schools of Burgdorf (Berthoud), July 1799 to June 1804. Goes to Munchenbuchsee, near Hofwyl, in June 1804, to work in conjunction with Fellenburg. Opens the Institute at Yverdun, at the southern end of Lake Neuchâtel, October 1804. The Institute is closed 1825. Returns to Neuhof, and dies there in February 1827. Pestalozzi's most valuable works are as follows: First volume (the best) of *Leonard and Gertrude*, 1781; Letter to Gesner describing the experiment at Stanz, 1799; *How Gertrude teaches her Children*, 1801; *Book for Mothers*, 1803; *My Swan-Song*, 1826; a complete (or almost complete) edition of Pestalozzi's works, in eighteen volumes, has been published by Seyffarth at Brandenburg, the last volume of which appeared in 1873. Taking as our guide the fifteen letters written to Gesner in 1801, and entitled *How Gertrude teaches her Children*, the following are Pestalozzi's leading principles: (1) Intuition, or knowledge attained directly through the senses, is the groundwork of all knowledge. (2) Language ought to be closely united with intuition, and taught in connection with objects by means of exercises in expressing what has been intuitively learnt. (3) The time of learning details is not the time for reasoning and criticising. (4) In every branch of education we should commence with the simplest elements, and thence continue step by step following the development of the child, i.e. by a psychologically connected series of lessons. (5) We ought to dwell long enough on each step for the child to obtain complete mastery of it, so that he can deal with it at his will. (6) Teaching should follow the path of development, not that of dogmatic instruction. (7) The individuality of the child should be sacred in the eyes of the teacher. (8) The principal end of elementary or primary instruction is not to make a child acquire information and accomplishments, but to develop and increase the powers of his intellect. (9) To knowledge must be added power; to acquaintance with facts, the ability to make use of them. (10) The relation between master and pupil, especially in matters of discipline, ought to be founded on and ruled by love. (11) Instruction ought to subserve the

higher aim of education. Pestalozzi remarks that for ages we have employed writing, reading, and arithmetic as the elements of education; they should be *language*, *number*, and *form*. A child should first be exercised in *seeing clearly*; and should then learn to thoroughly appreciate form by its simplest elements, the straight line in various positions, angles, &c.; to measure with the eye distances and inclinations; and then to draw, i.e. to copy on his slate, the lines, angles, figures, &c. These first exercises in linear drawing will lead up to writing. In these exercises Pestalozzi made great use of squares, which could be put together or divided up in numberless ways. For measuring, and as a preparation for geometry, he again employed small squares and rectangles on surfaces. In arithmetic, he used 'tables of unities,' in which every unity was represented by a dot or a stroke; and thus made the eye help in doing addition, subtraction, &c., whilst the children were exercised in numbers, not as names, but as collections of dots or units. Then followed 'tables of fractions'—squares divided into a variety of equal parts by horizontal lines; then 'tables of fractions of fractions'—the same squares with vertical divisions added. By means of these the ordinary operations of vulgar fractions can be performed before symbols are employed. Later on, he treats of *intuition*, as he calls the perception resulting from direct personal experiment, both physical and moral. All descriptions, he holds, all explanations and definitions, have no effect on the mind of the child unless they rest on ideas already gained by intuition. In teaching the child to read, i.e. to articulate the sounds corresponding to various arrangements of letters, or to recognise written or printed words, we seem to think that we open for it the gate of all knowledge. In this way we may make men of books, men of words, men of *letters*, but not wise men. Instead of arousing and exercising in a child's heart the feelings of faith, piety, and virtue, we make it at once learn a catechism, a collection of abstract doctrines entirely incomprehensible to it—words, words again, and not things. In all branches of education we should first teach the child to see things clearly, then to state what he sees, and then, *lastly*, to frame definitions. To this brief and bald account of a remarkable series of letters may be added some extracts from the first part of the *Swan-Song*, written in 1826. 'The idea of elementary (or primary) education to which I have consecrated my life,' he says, 'consists in re-establishing the course of nature. It should concern itself with developing the heart, the mind, and the practical skill of man. It requires a fair proportion amongst the forces of human nature; and this fair proportion requires the natural development of every force. Now every force is developed according to laws peculiar to itself, and by the simple means of exercise. Man develops the fundamental elements of his moral life, i.e. his love and faith, by the exercise of love and faith; those of his intellectual life, i.e. his thought, by the exercise of thought; those of his practical or industrial life, i.e. the power of his organs and his muscles, by the exercise of this power. Man is urged by the very nature of the forces (or faculties) in him to employ them, exercise them, give them all the development, all the perfection, of which they are capable. These faculties exist at first only in germ; and the desire to exercise them augments with every successful effort, and decreases with every failure—especially when the failure entails suffering. The first stage of education should strive so to regulate the exercise of the faculties that every effort in every department shall be successful. The essential condition for the development of a child's *moral* nature is tranquillity. Excitement, excess of care or of indulgence, are wholly hurtful. The starting point of thought is intuition, i.e. the immediate impression which the world makes on our senses, inner and outer. So the power of thinking is formed and developed at first by the impressions of the moral world on our moral sense, and by those of the physical world on our physical senses. These impressions, perceived by the understanding of the child, give him his first ideas, and at the same time the desire to express them—at first by gesture, and then by speech. In order to speak, one must have ideas, then organs of speech exercised and supple. One can speak clearly and exactly only of what one has tried, seen, heard, felt, tasted, or touched, in a clear and exact way. To teach a child to speak, it is therefore first of all necessary to make him try, see, hear, &c., many things—those which please will be

the best, so that his attention may be given readily. He must be made to observe them in an orderly way; and each one of them till he understands it thoroughly. At the same time he must constantly be exercised in putting his impressions into language. That the child may learn to compare and discriminate, his faculty or power of thinking should be exercised on two special elements of human knowledge—*number* and *form*. The art, practical skill, ability, by which a man can make real outside him what he has conceived inside him, I call his *industrial* life. This has two elements—the inner one is the power of thought, the outer is practical ability. To be wholly productive of good it requires harmonious joint action in the development of heart, mind, and body. This practical ability must have its gymnastic, just as the moral and intellectual faculties have. . . . When the power of using words does not spring from the real experience of life, it does not develop the forces of the intellect—it produces only a superficial chattering. . . . The education of to-day presents the child at one time with a crowd of ready-made judgments, which he may hold in his memory, but which leave his power of thinking inactive, and even tend to paralyse it; —at another, under the name of logic, it presents him, in a manner more subtle than clear, with a system of the eternal rules which direct human thought. But these are only a closed book to the child who does not already possess the power of thinking. The exercises in *number* and *form* must not be used mechanically, but in a well-arranged and well-graduated course; so that the child may surrender himself to them with pleasure and with success; so that his power of thinking may be always actively employed in them, that his judgments may be his own work; and lastly, that the whole of what is done may be always in close touch with the actual life of the child. . . . Elementary education renders the child active from the very commencement; makes him produce by his own powers results really his own; preserves his originality; and gives us a man less likely to servilely follow the crowd. . . The education of to-day, by its means and methods, rather takes us excursions into what is strange and unknown, than develops that which is in us, and which we need as independent beings.' Space prevents our quoting more fully. We shall now summarise and fill in what still remains to be said. Pestalozzi holds that every child possesses faculties which can be, and should be, developed in accordance with the nature of each. That every faculty is developed by its exercise, and only by its exercise. Nature prompts and encourages this exercise. The medium in which the faculties can alone be properly exercised is one of tranquillity, not excitement. In the development of the faculties, a proper and due relation between them should be preserved. He divides the activities of these faculties into three sections: *intellectual*, *moral*, and *industrial* or *practical*. In each section the teacher must base his work on the ascertained development of the faculties. The exercises must be carefully graduated, and gradually expansive, each stage being thoroughly understood before the next is attempted. The child's development is helped only by what he thoroughly understands, and by what he does for himself. He must be guided, not driven. In the training of his *intellect* the child must be brought into personal contact with concrete things, and must himself ascertain their nature by experiment. To enable him to express the knowledge thus acquired, he must be guided in the acquirement and use of clear and definite language. He must never be required to speak about what he does not personally know. *Language*, then, must be one of the first subjects of early education. With language must be joined *number* and *form*—number leading up to arithmetic; form to drawing, writing, and geometry. In the main, however, drawing belongs to the *industrial* section. Nearly all the branches of the intellectual section, especially mathematics—which owe so much to Pestalozzi's colleague Schmid—were carefully worked out by Pestalozzi and his colleagues. In geography the practical method is especially noticeable. Prof. Vulliemin tells us that the children at Yverdun were taken to a district, and after a careful examination of it, were made to picture it in a map, and to describe it in words; and that their errors were corrected by subsequent visits. Geology, botany, and natural history were all brought in under this head. Some efforts were also made to provide elementary training in animal physiology. The history teaching was based on that of the village

and thence extended to the canton and the native land. In the *moral* division everything is based on love, and trustfulness or faith. Without these tranquillity is impossible; and hence the moral division can never be left out of early education, for which tranquillity is an absolute necessity. Love and trustfulness grow best at home; and so the ideal home life is the model for this division. The power of beauty, both concrete and abstract, is fully recognised; and hence an appreciation of physical nature, of music, noble action, and art generally, is insisted upon. (With regard to the first, Pestalozzi's teaching strongly resembles that of Wordsworth.) Catechisms and dogmatic teaching generally are discarded. Development is only obtained by action, not by words. In the *industrial* division the household work of home life again best affords the first exercises in practical skill. With this should be joined practice in some manual trade, such as weaving; while gymnastics, games, military drill, and agriculture, will afford suitable training out of doors. Practical skill, moreover, presupposes intellectual training, and cannot be properly successful without it. This point is insisted upon. General education must precede and form the basis of special or technical education. In conclusion—whether we agree wholly or only in part with Pestalozzi's views—we must remember that the mental training of children was not the principal object to which this wonderful man devoted his life with such ardent, unflagging, loving activity. What he strove above all to reform and regenerate was moral and religious education—not for an individual, nor for a class, but for the whole nation and the whole world; what he longed above all to develop was the heart—its love, its trustfulness, and its sense of beauty. What above all he sought without ceasing to form were *men*, reverent-minded, original, self-dependent, moral—fitted for free government, devoted to their home duties, their neighbours, and their country.

Petites Ecoles. *See* JANSENISTS.

Petty, Sir William (1623–1666), the founder of the Lansdowne family, addressed a letter to his 'honoured friend, Master Samuel Hartlib,' on the *Plan of a Trade or Industrial School*, which letter was printed at London in 1647. He proposed 'that there be instituted *Ergastula Literaria*, literary work-houses, where children may be taught as well to do something towards their living as to read and write.' 'That the business of education be not (as now) committed to the worst and unworthiest of men; but that it be seriously studied and practised by the best and ablest persons.' 'Since few children,' he says, 'have need of reading before they know or can be acquainted with the things they read of, or of writing before their thoughts are worth the recording, . . . much less of learning languages when there be books enough for their present use in their own mother tongue; our opinion is that those things, being withal somewhat above their capacity (as being to be attained by judgment which is weakest in children), be deferred awhile, and others more needful for them, such as are in the order of nature before those aforementioned, . . . be studied before them. We wish therefore that the educands be taught to observe all sensible objects and actions, . . . that they use such exercises, whether in work or for recreation, as tend to health, agility, and strength of their bodies; . . . that in no case the art of drawing and designing be omitted, . . . since the use thereof for expressing the conceptions of the mind seems to be little inferior to that of writing, and in many cases performeth what by words is impossible. That the elements of arithmetic and geometry be by all studied; being not only of great and frequent use in all human affairs, but also sure guides and helps to reason, and especial remedies for a volatile and unsteady mind. . . . That all children, though of the highest rank, should be taught some gentile manufacture in their minority.' Then follows a long list of 'mechanical arts and manufactures,' for the proper practical teaching of which, and for experimenting in and improving them, there should be workshops presided over by practical men, botanical and zoological gardens, a library, an astronomical observatory, 'galleries of the rarest paintings and statues,' and in fact everything needful to render the college 'an epitome or abstract of the whole world.' Want of space prevents our quoting more from this excellent tract. But we must not omit mention of the striking passage in which the author dwells on the *practical* value of his technical institute, and forcibly points out that 'children do most naturally delight in

things, and are most capable of learning them, and how they love toys, making ships with paper, setting even nutshells a swimming, handling the tools of workmen, as soon as they turn their backs, and trying to work themselves,' and so on—a plain hint from nature as to how education should begin.

Philanthropic Society. *See* REFORMATORY SCHOOLS.

Philology is the science of language. The term is sometimes used of all investigations connected with written or spoken language; but it is now applied in England especially to that science which is based on inductions drawn from comparison of the phenomena of different languages, and which from thence traces the origin of words, and their changes in form, meaning, and relation. Of this science Comparative Philology is the more correct title. The founder of scientific or Comparative Philology was Franz Bopp (1791–1867), who, first in 1816, and afterwards more fully in his *Comparative Grammar*, demonstrated the common origin of the inflexions in the Indo-European family of languages (Sanskrit, Persian, Greek, Latin, German, Celtic, &c.). Bopp considered that all I.-E. words were derived from monosyllabic *roots*, verbal or pronominal, which once had an independent existence, and that each noun or verb was formed by the 'agglutination' of two roots to one another. *Phonetic laws*, or the laws governing the change of sounds, were, he held, liable to numerous exceptions. The formulation by Grimm of the law regulating the shifting of mute consonants in High and Low German, as contrasted with Greek, Latin, and Sanskrit, led Pott to devote as much attention to phonetic laws as Bopp had given to inflexions. Still following Bopp in the main, Schleicher (1821–68) attempted to reconstruct the original Indo-European forms; while Curtius, in his *Principles of Greek Etymology* (1858) and *Greek Verb* (1877), laid a solid foundation for Greek philology. But now there set in a reaction, headed by Brugmann in Germany and by Sayce in England. The 'New School' insisted that the principles of linguistic research should be chiefly deduced, not from obsolete written languages, but from popular dialects now spoken; the starting point must be sounds, not letters. In this view there seems considerable truth. There is great danger of confusing the study of language—that is, of words—with the study of written symbols, which are often very unsafe representations of words; thus, Dr. Murray's Dictionary distinguishes fifty-four vocalic sounds and combinations in current English, to denote which we have only five letters and combinations. A careful study of phonetics and the physiological aspects of sound-production is necessary, in order to understand the origin of changes in sounds, and to estimate the probability of changes assumed. The two other main principles of the New School are that all phonetic laws are invariable, and that apparent exceptions are due to analogy. From the former of these propositions it follows that vowels must be as much subject to phonetic laws as consonants. Voltaire defined etymology as 'a science in which the vowels went for nothing, and the consonants for very little.' Curtius seems not wholly free from this charge; for in his *Greek Etymology* much more space is devoted to 'sporadic' than to 'regular change of sounds,' while in his book under the latter title the vowels find no place at all. The New School has proved beyond doubt that the changes of vowels are as regular as those of consonants. The doctrine that phonetic laws are invariable has been attacked as an assertion incapable of proof. The truth seems to be that phonetic laws are invariable, unless interfered with by some other phonetic law or by analogy. Thus it is a phonetic law that verbal adjectives in *-τός* through change of accent lose the *ε* of the present, as *φεύγω, φυκτός*; yet *σκέπτομαι* has *σκεπτός*; here the law has been interfered with by another phonetic law, viz. that *σκπτ* is unpronounceable. Again, Fr. *écrevisse* has become 'cray-fish' irregularly; here the phonetic law has been disturbed by analogy, or the desire of assimilating the unknown new word *écrevisse* to the known word 'fish.' So the late *οἴδαμεν* for *ἴδμεν* is evidently formed on the analogy of *οἶδα*. The influence of such analogy and desire for uniformity is assumed by the New School wherever changes cannot be explained by phonetic laws. But, though we may in such cases generally assume the influence of some analogy, it is often impossible to do more than guess what particular analogy has had influence in a particular case. Still, the progress of knowledge has tended to banish more and more the element of chance from linguistic

change. Besides analogy, whose influence on meaning has been greater than on form, the two chief factors in phonetic change have been laziness, or desire of easier pronunciation, which has changed, e.g., *ἐλεημοσύνη* into 'alms;' and emphasis, for the sake of clearness, which has changed, e.g., Fr. *imprenable* to Eng. 'impregnable.'

The origin of language is still disputed; but it is probably due partly to imitation of natural sounds, *e.g.* cuckoo; partly to interjections, *e.g.* 'ah!'; partly to invention, of which there are instances even now in the Kafir and other dialects. It is certain, however, that primitive words denoted particular and concrete ideas.

According to relationship, the languages of the world fall into about twelve main groups, the chief of which are the Indo-European, the Semitic (Hebrew, Phœnician, Syrian, Arabian, Assyrian), and Turanian (Mongol, Hungarian, Turkish, &c.); there is no trustworthy evidence at present that these groups had a common origin.

According to structure, languages may be divided into (1) isolating, consisting of roots only, *e.g.* Chinese; (2) agglutinative, in which roots are placed side by side to form a word, *e.g.* Finnic; (3) inflexional, as Indo-European and Semitic. Bopp held that all inflexional languages had passed through the first two stages, and that their words were formed by the union of two once independent roots. Ludwig, Sayce, and others, however, now deny this; they regard I.-E. roots as being only the results of our analysis, and as never having had an independent existence; while inflexions did not necessarily once exist in the form of roots, but were often originally meaningless, and afterwards 'adapted' to convey different meanings. On the whole this theory seems the most satisfactory; the chief argument for the agglutination theory, viz. the identification of Greek *-μι*, *-σι*, *-τι* with personal pronouns, is now generally discredited.

The Indo-European (Aryan or Indo-Germanic) group, to which Comparative Philology has been especially applied, comprises eight main families of language, (1) Aryan (Sanskrit and Persian), (2) Armenian, (3) Albanian, (4) Greek, (5) Italian, including Latin (with its daughter languages French, Italian, Spanish, Portuguese, &c.), Oscan, Umbrian, &c., (6) Celtic (Irish, Gaelic, Welsh), (7) Teutonic (Gothic, English, German, Scandinavian), (8) Letto-Slavonic (Lithuanian, Russian, Bulgarian, &c.). Some philologists include Etruscan also. All these languages go back to one parent speech, whose speakers probably lived near the Baltic (see Sayce, Address to British Association, Sept. 1, 1887; Schrader, *Sprachvergleichung und Urgeschichte*, 1883). The order of their separation cannot yet be determined; but Latin seems to have a close affinity with Celtic (they alone have genitive in *-i*, future in *-b-*, passive in *-r*). Mommsen's theory that there was once a Græco-Italian period, in which the Greeks and Italians lived together apart from the rest of the I.-E. family, is now generally discredited; for apart from what is borrowed and what both derive from I.-E., Greek and Latin stand almost entirely apart both in forms and vocabulary; their terms for religion, politics, social life, war, &c., are nearly all, where not I.-E., utterly distinct (see Nettleship, on 'Early Italian Civilisation,' in *Essays on Latin Literature*, 1885). An Italo-Celtic period is more probable.

The I.-E. *sounds* were: (1) *Spirants*, s, z, y, v. (2) *Explosives*, *labial* p, b (? ph), bh, *dental* t, d (? th), dh, *palatal* k, g (? kh), gh, *velar* q, ġ (? qh), *gh*, the last series admitting a 'w' sound after them, and occurring especially before e. *Palatal* k, g, gh = Gk. and Lat. *κ*, k; *γ*, g; *χ*, h, g. The *velar gutturals* appear in Greek as *π*, *τ*, *κ*; *β*, *δ*, *γ*; *φ*, *θ*, *χ*; in Latin as qu, c; v, gu, g; f, b, gu, v, h, g. Grimm's well-known law of the change of the explosives in Teutonic has been modified by Verner's discovery that the medial changes vary according to the accent—*e.g.* *φράτηρ*=Goth. *brothar*, O.H.G. *bruodar*, but *πατήρ* = Goth. *fadar*, O.H.G. *fatar*. The influence of *accent*, which in I.-E. was probably one of pitch, is being proved of more and more importance. (3) *Liquids* r, l. When *e* of unaccented er between two consonants dropped out, r and l had to perform the functions of vowels or sonants; when used as *sonants* (vowels) ṛ and ḷ = Gk. *αρ*, *ρα*, *αλ*, *λα*, e.g. *ἔδρακε* for édṛke, from *δέρκομαι*, Lat. or, ol—e.g. *fors* for fṛtis, fero. (4) *Nasals*, m (labial), n (dental), ñ (palatal), n (velar), all also used as sonants, e.g. I.-E. *tn̥tós* = Gk. *τατός*, Lat. *tentus*. (5) Vowels, a, e, i, o, u, both short and long; a neutral vowel e (represented by *a* of *πατήρ*); i̯ and u̯ as consonants. The presence of e and o in I.-E. has been exhaustively demonstrated by De Saussure.

The *inflexions* of I.-E. were highly elaborate. Of the noun there were probably eight cases: nominative, vocative, accusative, genitive, dative, locative, ablative, and instrumental; also three numbers, singular, dual, and plural, the dual being older than the plural. The verb had an active and middle voice, but no passive; four moods—indicative, imperative, optative, and subjunctive (perhaps also an injunctive mood); and five tenses—present and perfect (reduplicated), imperfect and aorist (augmented), and the future.

I.-E. *syntax* has so far been little studied; we know, however, that the verb generally came at the end of the sentence, and the attribute before the word it qualified. (*See* Bergaigne, *Mémoires de la Société de Linguistique*, ii. 5; Delbrück, *Syntaktische Forschungen*, vol. v.)

The I.-E. *vocabulary* had very few words for abstract notions. Its sematology, or the scientific study of the changes of meaning it underwent, has not yet been satisfactorily treated. Indeed sematology in general has been much neglected. Hence the order of development of meanings is frequently wrongly given even in our best dictionaries; e.g. the Latin *minerva* (mind) is wrongly explained as a metonymic use from the name of the goddess; whereas the latter is but a personification of the abstract noun seen in 'invita minerva,' in 'prominervat,' and in Marsian ablative 'minurbid' (decree). (*See* Nettleship, *Latin Lexicography*. For a scientific treatment of sematic change, *see* Littré's *French* and Murray's *English Historical Dictionary*.)

See Peile, *Primer of Comparative Philology*, 1*s.*; Max Müller, *Lectures on Language*, 1861, 16*s.*; Sayce, *Comparative Philology*, 1874, 10*s.* 6*d.*; *Science of Language*, 1879; Sweet, *Handbook of Phonetics*, 4*s.* 6*d.* *Indo-European*: Brugmann, *Elements of Comparative Grammar*, vol. i., 1886, tr., 18*s.* (the best book on I.-E. phonetics); *Der heutige Stand der Sprachwissenschaft*, 1884, 2*s.* 6*d.* (defence of New School); F. de Saussure, *Voyelles Indo-Européennes*, 1879; Delbrück, *Introduction to Study of Language*, 1881, tr., 5*s.* *Greek and Latin*: King and Cookson, *Sounds and Inflexions in Greek and Latin*, 1888, 18*s.* (all the earlier English manuals are quite out of date); Curtius, *Greek Etymology*, 1879, tr., 36*s.*; *Greek Verb*, tr., 1877, 12*s.*; *Elucidations of Greek Grammar* (Greek inflexions), 1863, 6*s.*; Wharton, *Etyma Græca*, 1884, 10*s.* 6*d.*; Brugmann's Greek and Stolz's Latin Grammar in Iwan Müller's *Handbücher*, 1885 (good summary of results), 5*s.* 6*d.*; Meyer, *Griechische Grammatik* (best Greek grammar), 1886, 14*s.*; V. Henry, *L'Analogie en Grec*, 1883, ab. 8*s.*; *Grammaire comparée du Grec et du Latin*, 1888, 6*s.* 3*d.*; Wordsworth, *Early Latin*, 1874, 18*s.*; Roby, *Latin Grammar*, 1871, vol. i. 9*s.*; Conway, *Verner's Law in Italy*, 1887, 5*s.* *English, &c.*: Earle, *Philology of English Tongue*, 7*s.* 6*d.*; Skeat, *English Etymology*, 1887, 9*s.*; Sweet, *History of English Sounds*, 1888, 14*s.*; Douse, *Gothic of Ulfilas*, 1886, 6*s.*; Diez, *Grammar of Romance Languages*; Brachet, *Historical French Grammar*, 1869, 3*s.* 6*d.*; *Etymological French Dictionary*, Introduction, 1868, 7*s.* 6*d.*

Philosophy.—The term 'philosophy' (Greek, *φιλοσοφία*) was first used by the Greeks to indicate the love of knowledge of any kind. Later on, mainly by the labours of Aristotle, the most systematic thinker of antiquity, it acquired a special reference to a certain portion or kind of knowledge. It was marked off from the special sciences as the investigation of the ultimate notions, such as cause, substance, reality, which underlie the special sciences but are not investigated by these. The work of philosophy is to co-ordinate the results obtained by the special sciences, as physics, chemistry, biology, &c., so as to provide a general theory or explanation of the universe, so far as this is obtainable. This work of philosophy in using and supplementing the results of scientific teaching, by giving us a final account of the nature and origin of real things, is specially marked off as metaphysic. Closely connected with this is another and more recently recognised department of philosophic search, viz. theory of knowledge. This considers critically the question how the human mind can have certain knowledge at all, and seeks to define the criteria or marks of true knowledge as distinguished from the false semblance of it. In addition to metaphysic and theory of knowledge, philosophy is commonly taken to include psychology, or the science of mind; logic, or the science which deals with and seeks to regulate the processes of thought or reasoning; ethics, which aims at defining the ultimate ends of conduct; and æsthetics, which investigates the nature and laws of beauty (*see* articles PSYCHO-

LOGY, LOGIC, and ETHICS). From this short account of the scope of philosophy we may be able to determine its proper place as a subject of study. The educational importance of philosophy depends on the fact that it disciplines the mind in thinking about things in the most general way, tends to widen the intellectual horizon and preserve the specialist from narrowness of views, and favours a thoughtful and critical attitude of mind. To this it may be added that though the high problems of philosophy seem remote from all practical interests, they answer to intellectual impulses and longings which are as old as man, and which display themselves very distinctly in the history both of the race and of the individual. As a group of studies of a particularly abstract and difficult nature, philosophy belongs to the last or university period of scholarship. In the history of the university system on the Continent and in Great Britain philosophy has occupied a prominent and honoured place in that general course of studies which is now marked off from the more distinctly professional courses as the 'faculty of arts,' or by the Germans as the 'faculty of philosophy.' It now holds the firmest place perhaps in Germany and Scotland. In Oxford it is studied too much merely as a branch of classical literature, and though the institution of the moral sciences tripos at Cambridge has distinctly raised its status at the other ancient university, there must be set off against this gain the more recent changes in the modern University of London, by which philosophy has ceased to be a necessary element in the arts curriculum. From this it is evident that owing to the multiplication of educational subjects, and the growing demands for special and technical knowledge, philosophy will have to fight hard in order to maintain her ancient place of dignity. The estimation in which she is held can, however, only permanently fall when the estimate of a liberal education itself declines. It has a particular utility for the educator, partly because the study of it will lift the specialist teacher above the narrow limits of his subject, and enable him to deal with it in a larger, more thoughtful, and more truly educational manner; partly because in its special branches—psychology, logic, and ethics—it supplies the basis of a theory of education. Finally, it may be observed that though philosophy, as we have seen, finds its proper place in the university, as distinguished from the school curriculum, the question is being warmly discussed, especially in Germany, whether some portions of philosophical study, more especially formal logic, and the elements of psychology and of ethics, ought not to be taken up in the secondary schools as a preparation for university studies.

(On the scope of philosophy *see* Sir W. Hamilton, *Lectures on Metaphysics*, lect. iii., and art. 'Philosophy' in the *Encyclopædia Brit.* 9th ed.; on its place in education *see* Hamilton, *Lectures on Met.* i. and ii., and an article, 'Philosophy as a Subject of Study,' by Professor G. Croom Robertson, in the *Fortnightly Review*, vol. x. (1868); and on its fitness to be a subject of school-teaching, consult the art. 'Philosophische Propädeutik,' in Schmidt's *Encyclopädie*.)

Phrenology (Gr. *φρήν*, mind, *λόγος*, discourse) is the name which was given by Foster in 1815 to that science which affects to be a philosophy of mind based upon the physiology of the brain. The four cardinal principles of the new science, as it has been expounded by its best advocates, are that the mental powers of man can be analysed into a definite number of independent faculties; that these faculties are innate, and each has its seat in a definite region of the brain; that the brain is the organ of the mind; and that the size of each of these regions is the measure of the power of manifesting the faculty associated with it. Phrenology thus assumes a twofold aspect, namely, a system of mental philosophy, and a method whereby the disposition and character of the individual may be ascertained. The attempt to read the mind and character of a man by an examination of the external features of the head was not for the first time made when the science of phrenology was first propounded. Attempts indeed have been made from the earliest times. Gall, the leader of the phrenological movement, settled in Paris in 1807, where he made many influential converts. He next visited Great Britain, and with the assistance of Spurzheim and George Combe, the spread of the new gospel under him was rapid. Amongst the many influential disciples were Elliotson, Mackenzie, Laycock, and Archbishop Whately. In 1832 no fewer than twenty-nine phrenological societies were esta-

blished in Great Britain, besides many phrenological journals. The theory had, however, many formidable opponents. Thomas Browne and Jeffrey severely criticised it in the pages of the *Edinburgh Review*, while Wilson ridiculed it in *Blackwood*. The popularity of the movement has now greatly waned, and few societies have survived; indeed in Edinburgh, where the movement had taken its firmest hold, the large museum has had to be closed, and the funds devoted to other objects under the direction of the Court of Session. The theory is still cultivated by a few enthusiasts, such as will be attached to any cause, and some professional teachers who follow phrenology as a vocation. At the same time it cannot be denied that the theory has an admixture of assumption and truth. The method followed by its founders was to select the place of a faculty, then to examine the heads and casts of persons with that peculiarity in common, and then find out the distinctive features of the characteristic trait. Gall thereby fixed upon twenty-six organs for his model head, while others raise the number to forty-three. Spurzheim divided the component faculties of the mind into (1) feelings with propensities, i.e. internal impulses, inviting only to certain action, and with sentiments, i.e. impulses which prompt to emotion as well as to action; and (2) intellectual faculties, perceptive and reflective. Several of the faculties so assigned to the mind are redundant in some particulars and deficient in others. Thus we have both form and size. Metaphysicians tell us that a knowledge of extension includes the two, form being but the comparative extension of two several objects. Similarly, again, the organs of combativeness and destructiveness coincide so nearly that the absence of the one would scarcely be missed if the other were in vigour. They are also deficient in their organs. Thus they provide for a love for children, but not for parents; for a love of wealth, but not of animals; for the love of truth, but not of mendacity; yet the latter organ in each of these cases has as much claim to originality as the former. Many of them, again, are so heterogeneous in their nature that they may indicate faculties or dispositions diametrically opposite, while others are furnished with compensating organs which balance the good or the evil, and thus render both ineffective. Thus the organ of secretiveness indicates a thief as well as a novelist. The fundamental doctrine with respect to the utility of an organ is that its size determines the power of the alleged faculty or propensity belonging to it. But it can hardly be admitted that size alone is a true criterion, for it is a well-ascertained fact that the vigour of any faculty may be increased by education or exercise, or even of desire, without any corresponding increase in its size. Hence phrenology is deprived of one of its best marks to test the intellectual strength of the patient. It is indeed surprising how little solid progress resulted from this controversy; indeed, further than a somewhat stimulating research into the anatomy of the brain, nothing was done. Most of the anatomical details contained in the works on phrenology relate to controversial matters of secondary importance, and presuppose the truth of the theory, but even in connection with them they give us no statistical details of any value.

Physical Education.—It is now well recognised that to be 'a good animal' is one of the first requisites to success in life, and that for this purpose proper food and exercise are of prime importance. When we remember that one-fourth of the whole blood of the body is contained in the substance of its muscles, the importance of due exercise of them becomes evident. Muscular exercise is important in its influence on the general health and on the brain. The muscles increase in size and strength by steady and systematic exercise. The action of the lungs is increased, more pure air being inspired, and more impurities expired, while the actual girth of the chest and size of the lungs becomes increased. By its means a flat-chested condition may be cured, and consumptive tendencies obviated. The action of the skin is increased, the circulation is improved and rendered more equable, the production of heat is increased, and cold feet and chilblains become a thing of the past. The muscles cannot act of themselves; their movements are controlled and regulated by nerves which have their ultimate origin in the brain. There is a motor part of the brain corresponding to the muscles which is in intimate communication with the intellectual parts of the brain, and which can only attain its full vigour when the whole muscular system

is in a well-developed and healthy condition. Each nervous centre requires external stimuli to develop its potential power. The motor part of the brain requires muscular exercise, the sensory part requires exercise of the special senses, and the intellectual part (which is probably independent of the other two parts, though it co-ordinates and regulates their action) requires exercise of the memory and reasoning powers. It is only when these three kinds of exercise are duly proportioned, and each fully executed, that the highest attainable development of the brain is secured.

Excessive muscular exercise very seldom occurs in children. It is only in competitive running or rowing (or similar sudden and violent exertions) that danger arises. Palpitation and occasionally dilatation of the heart may be produced, sometimes also spitting of blood. Competitive exercises should be carefully regulated and graduated in the previous training, and no boy should be allowed to join in them unless he has passed a searching medical examination. There is no necessary antagonism between mental culture and athleticism. The 'proverbial stupidity of the athlete' simply means that the mental faculties have become rusty from want of use. But where one person suffers from excessive exercise, multitudes suffer from idleness. *Deficient exercise* is especially common in girls, and in consequence the general health is considerably impaired, the digestion is enfeebled, the circulation becomes unequal, and nervous irritability and sleeplessness often follow. The tendency to lung diseases, especially consumption, is greatly increased. The figure is lamentably affected, the shoulders tend to droop, the chest becomes flat, the gait stooping, and the spine may become laterally twisted, owing to the flabby condition of the muscles supporting it. The imprisonment of the figure in tight corsets is a common cause of deficient exercise of the trunk muscles in girls. In taking exercise the following rules are valuable. The clothing should always consist of flannel next the skin, and should be loose enough to allow free play of the limbs and expansion of the chest. There is no danger from excessive perspiration, but only afterwards: hence sitting in a draught or keeping on wet clothes (when flannel has not been worn) should be carefully avoided. The exercise should be systematic and regular, not sudden and violent. Every part of the body should be exercised, and the exercise should be taken as far as possible in the open air, and not directly after meals. The value of girls' calisthenics is greatly reduced by their being commonly taken indoors.

Physics.—This term may be defined in many ways, but the following equivalent modes of expressing its meaning will assist:—(1) It is the science which treats of the phenomena presented by bodies. (2) It treats of matter, energy, and motion. (3) Hence it includes the discussion of gravitation and molecular attraction, and other general properties of solid bodies, liquids, and gases. (4) The following subjects are therefore branches of this science: Mechanics, hydrostatics, including pneumatics, heat, sound, light, magnetism, and electricity. (5) The science of nature has three divisions according to the point of view under which the bodies of the universe are studied. These bodies may be examined with relation to their *general* properties, with relation to their constituent parts and *peculiar* properties, and with relation to their appearances and *external* qualities. *Physics* (in its modern acceptation replacing the term Natural Philosophy) has for its object the general properties of bodies, their mutual actions on each other, their causes, effects, phenomena, and laws. *Chemistry* studies the peculiar properties of bodies, their elementary principles and combinations; and *Natural History*, in its widest sense, observes their external characters and appearances, classifies, and arranges them. It will be seen that the lines of division of these three divisions of science are not always distinct; hence, in text-books on physics we frequently have a chapter on chemical physics, and in works on chemistry a chapter on physical chemistry. But for the purposes of school teaching it is not necessary that the facts dealt with should be kept rigidly and strictly to their own section; and however different the case may be with advanced professors of the sciences, teachers and scholars who are intending chiefly to deal with one section may make excursions into the others without fear of exciting jealousy and resentment. Let us now first ask, What is the aim of physics when used in school-teaching, and then consider differences in

the methods of dealing with the subjects at different stages of education. The objects to be aimed at are as follows: To teach the children (1) To *observe* objects and operations. (2) To *describe* accurately what is seen and done. (3) To *reason* on simple phenomena. Now, there should be three courses, or three periods, in which these three objects in succession have the chief consideration. In the first course of science-lessons given to the youngest children we should tell little or nothing: we should tell only the names of things used, and as few of those as possible. The object being to excite a love of observation and a longing for scientific knowledge, the lessons will principally consist in exhibiting differences, and getting them seen and pointed out. In the first stage the teacher will be satisfied with evidences of observation, but in the second stage he will be bent on receiving the answers to all questions in scientific and grammatical language. Finally, he will put off to the last stage, or leave to be formed at a later time, the more general laws and the theories of science. The reason for this will on a little thought be evident. These theories and laws will form the crowning stones of the pyramid, and must be placed last, a broad base with many stones having been laid first. We must begin with the common and familiar properties of things —a glass of water or a bottle of air,— and from the beginning we should urge the young student to perform the experiments with his own hands.

When we have proceeded far enough to split physics into its elementary subjects, the branch claiming attention first is mechanics and dynamics. At present we are troubled by a difference of custom in the use of these terms. The older classification is as follows:

Mechanics, including	Statics, the science of forces acting on bodies at rest; and Dynamics, the science of forces which produce motion.

The more modern mode of division uses the term 'dynamics' as the science of force generally:

I. *Kinematics*,	the science of pure motion independently of force.
II *Dynamics*, including	(*a*) *Kinetics*, the science of force producing motion.
	(*b*) *Statics* as above, and including mechanics, the science of machines in equilibrium.

Now, when we look on these sciences in their relation to the teaching of physics generally, we are driven to conclude that there are educational advantages in taking statics and the theory of simple machines before the more general dynamics.

An argument adduced in favour of the treatment of dynamics before statics is, that the second law of motion simplifies the exposition of the parallelogram of forces; and another, that the study of work should properly precede the study of the common machines. But in education we frequently lose more than we gain by attempting to deal with the most general ideas before we have established a sufficient number of elementary notions to make the comprehension of the generalised notion an easy matter. Again, dynamics is difficult to teach experimentally without considerable expense and some skill in experimenting; whereas the theorems of statics are capable of being easily verified by inexpensive apparatus, consisting chiefly of ordinary weights, rods, and strings, and requiring no great delicacy of manipulation. Finally, the subject of dynamics teems with fundamental difficulties which are not met with in statics; for example, the measure of a variable velocity, the difficult proofs of the fundamental formulæ for even uniform acceleration, the great difficulty of explaining the fundamental ideas concerning mass and force, the imperfectly-treated second law of motion, the immense labour of change of units, as from the pound to the gramme. from the weight of one pound to the dyne, from the food-pound to the erg, and so on. On these grounds the teaching of statics should begin first. After this the order will be as follows: the measurement of velocity and acceleration, force, mass, momentum, and energy.

A very useful piece of school-work will be done by grouping portions of all the branches of physics about the concept Energy in the way described in the article on Mathematics.

The term *energy*, and the great principle of the *conservation* or *persistence* of energy, the establishment of which will live in the history of science as the great achievement of the central part of the nineteenth century, have a scope far be-

yond the purely mathematical treatment of dynamics and the allied branches of physical science. The concept and the principle have already profoundly modified the views of the physicist as to the natural laws with which he is concerned, and are destined to form the starting point and firm foundation for all his conquests in the future. While the conception of energy has naturally arisen out of the higher mathematical treatment of dynamics, it has necessitated a very material recasting of that treatment in its most elementary as well as in its more advanced stages, if it is to bear any fruitful relation to physical science in general.

Of the other branches of physics that of heat presents many simple experiments which may be repeated in a school laboratory, and electricity is the branch which has most points of connection with the other branches. (*See* ELECTRICITY.)

Physiology (Animal) (*φύσις*, nature; *λόγος*, a discourse) deals with animal organs and their functions. As taught in schools, it takes man as the most perfect animal, and treats of human structure, organs, and functions, the illustrative dissections being made on any mammal, preferably on a rabbit or a guinea-pig. The study of the body commences with the structure of the internal, or *endo-skeleton*, and for the thorough comprehension of this it is necessary to have a complete skeleton, properly jointed, so as to make clear the connections of the various parts, and the mechanical adjustments which facilitate and limit the movements of the trunk and limbs. The points of insertion of the great muscles—which, with the bones to which they are attached, form levers of the three kinds in the body—can be marked on the skeleton, but it is not necessary for an ordinary science student to concern himself with the details of the muscular structure of the human frame; he may content himself with a sound knowledge of the large muscles of the limbs, of the larynx, and of the chest. In addition to the skeleton, the teacher should have a complete set of human bones, separated from each other, and the student should learn to recognise and name each bone apart from its position in the skeleton. Next comes the study of the great organs of the body, those concerned in digestion, absorption, circulation, respiration, and secretion. A clear comprehension of the relative positions of these organs is indispensable, and to this end two illustrative dissections are made by wise teachers: 1. A guinea-pig, spread on a board on its back, with its limbs attached severally to four nails driven into the corners of the board, has the skin from the throat to the pubes slit down the middle and laid back; with a pair of sharp scissors or bone-forceps the ribs are severed from the breast-bone and carefully removed; the muscles covering the abdominal cavity are slit down the middle and reflected. Thus the two great cavities of the thorax and abdomen, separated by the diaphragm, are laid open to inspection. Then the intestines can be lifted out, the membrane which holds them in place being sufficiently cut through to permit of their extension, and thus the deeper organs of the abdomen can be exposed. 2. A guinea-pig is laid on its side, the skin reflected, the ribs severed from the vertebral column, and the whole bony and muscular coating turned from the centre of the back across towards the chest, the diaphragm being carefully dissected off; a complete side view of the organs *in situ* is thus again obtained. After this has been done, the organs are separately studied. (All animals required for dissection should be killed with chloroform; the animal should be placed in a jar; a piece of cotton-wool, steeped in chloroform, should be dropped in, and an airtight cover securely fastened down.) The tissues of the body should next engage the attention of the student, and he should learn to recognise under the microscope osseous, adipose, fibrous, cartilaginous, muscular, nervous, vascular, and epithelial tissues; his attention should be carefully drawn to the differences between voluntary and involuntary muscular fibres, and to the various kinds of epithelium. He is then ready to appreciate the significance of the histological peculiarities of the organs to which his study is next directed. Each organ should be studied (a) in its minute structure, (b) in its function. A lesson on food-stuffs should precede the study of digestion, and the teacher can show such simple processes as the turning of starch into sugar—contrasting the non-dialysable starch with the dialysable sugar—and the emulsion of fats. The circulation of the blood is best shown by placing a living frog in a bag with one hind leg left out, and carefully stretching

the toes of the foot over a hole in a piece of thin wood, so that the web is over the aperture; pains must be taken to secure the foot without hurting the frog, and the frog must be supported so that the foot can rest on the stand of a microscope. A quarter-inch objective will give sufficient magnification to show the corpuscles rolling along the capillaries of the web. A sheep's or bullock's heart, with a few inches of the great vessels attached, serves conveniently as illustration of the mammalian heart, the chambers being laid open, while a large vein from any mammal's leg can be used for the demonstration of the valves. A practical study of the sense-organs presents considerable difficulties. A bullock's or sheep's eye makes a good demonstration, cut transversely; another should be dissected out, coat by coat; a good double convex-lens should be used to illustrate the formation of images on the retina. The external and middle ear can be demonstrated, but the dissection of the internal ear is beyond the powers of the ordinary student; notes sounded from vibrating strings and stretched membranes may, however, facilitate the conception of the many-stringed lyre of the human ear. The tissues of the eye, the tongue, the skin, and the nasal chambers, must be studied under the microscope. For the explanation of the nervous system it is necessary to remove the skull and part of the vertebral column of a rabbit, so that the connection between the cerebral mass, the spinal cord, and the sensory and motor nerves may be demonstrated; a dissection of the fore- or hind-leg serves to show the distribution of nerves to muscles. The sympathetic system is illustrated by the ganglia and fibres lying on each side of the backbone. A brain, preserved in spirit, is absolutely necessary for comprehension of its various parts, and sections of the spinal cord should be carefully studied under the microscope. Specimens, in spirit, of the brain and cord of a fish, a frog, a bird, a rabbit, and a man, are useful as showing the change in relative position and in size of the cerebral hemispheres, as the animal rises in the evolutional scale. There is, perhaps, no science the teaching of which is of more vital importance than that of physiology, with its bearing on hygiene and sanity of life-conduct. Half the diseases among rich and poor alike result from gross ignorance of the body and its needs, and a sound, though elementary, knowledge of physiology would prevent many a shattering of constitution and ruining of life.

Professor Huxley and Dr. Foster, in a recent report on the examinations in physiology of the Science and Art Department, state that a large number of the rejections were due to the candidates being ignorant of the simplest facts and principles of Physics and Chemistry, and point out that it is impossible for any one to understand physiology who is wholly ignorant of these two sciences; 'but,' add the examiners, 'the teachers do not seem to recognise this; they think they are teaching physiology when they make their pupils learn certain physiological statements involving physics or chemistry, without attempting to make them understand those statements. Thus in several papers there is evidence that the writer does not in the least know the difference between, and the relations between, carbon and carbonic acid; and yet he attempts to answer a question on respiration. We do not wish to suggest that candidates in physiology should previously satisfy the examiners in physics and chemistry; there are many valid objections against such a regulation. But teachers who send up candidates in physiology should understand that, from the very nature of the case, physiology cannot be studied in the absence of all knowledge of physics and chemistry, and that it is their duty to see that this knowledge is in some way or other supplied.'

Pictures.—There are two main uses for pictures in schools: one to exercise and develop the æsthetic sentiment, or the feeling for beauty—with which object the walls of the class-rooms, halls, and corridors should be hung with pictures (which can be done for a small outlay by applying to the *Art in Schools Association*, Queen Square, W.C.); the other to convey information to the mind, to fix it there, and to exercise the faculty of constructive imagination. With regard to the latter use it may be pointed out that it has long been accepted as an axiom that the best explanation of a thing is the sight and study of the thing itself; and the next best is a photograph or exact unembellished picture of the thing. This mode of explaining and conveying information has been largely used from quite early times, but is still

capable of considerably greater development—especially in the departments of geography and history. But besides conveying information, pictures may be used, and indeed are almost indispensable, for the cultivation of one of the most valuable of the intellectual faculties—the constructive imagination; both when the mental images constructed are exact or nearly exact copies of some original which exists or has existed (as in geography and history), and when the constructions are new combinations of material already acquired (as in science and in art, both literary and pictorial); in which latter case—when the combinations are new—pictures serve the purpose of suggestive models. The use of pictures as aids to the *memory* is too widely recognised to need more than mention. There is one *misuse* of them, however, which cannot be too often protested against; and that is in lessons of *observation*. In such cases pictures can never be properly used except when pictures themselves are the things to be observed. To study a picture instead of the thing itself differs hardly at all from studying a written account of the thing.

Plato (429–347 B.C.).—An ancient Greek philosopher, and the most distinguished of the pupils of Socrates. In his fortieth year he began in the groves of the Academy at Athens to teach his celebrated system of philosophy, which, in contradistinction to the schools of Realism and Materialism, is known as Idealism. Ideas (εἴδη), according to Plato, are the eternal divine types or forms, constituting the essences of things according to their several species, genera, families, and classes. These ideas are the substance of all knowledge, and the human intellect attains to the knowledge of them by '*Dialectics*,' that is, systematic examination and argument, by which the non-essential are distinguished from the essential elements. Plato, however, had a far higher aim than to lay down a correct science of the intellect. His object was to establish a sound theory of human life, and in his *Republic* he describes in detail his ideal of a perfect human community. That treatise, which starts with showing virtue to be the first necessity of a sound social life, describes at great length how men must be taught and trained to perform their several parts in such a community. While in Plato's *Republic* there is much that was exclusively adapted to Greek notions, there are at the same time, both in that and in most of his other works, many inspiring passages and profound observations bearing on the general question of education.

Plato's educational theory cannot be understood apart from his peculiar views of man and virtue. The supreme idea, according to him, was the idea of the good (τὸ ἀγαθόν), and the highest virtue or human perfection consisted in acquiring the knowledge of the good and bringing one's life into conformity with it. Human nature is tripartite, embracing mind (intellect or reason), seated in the head; the will, seated in the heart or breast; and the passions, or lower animal nature, seated in the stomach. Each division has its special virtue; that of the mind being wisdom; that of the will manliness, courage, or valour; and that of the passions moderation or sobriety. In Plato's ideal State men divided themselves into classes corresponding to these virtues. The lowest were those who supplied man's physical wants, the labourers. Above them stood the guardians of the law and of the safety of the State, the police, the warriors, &c., the representatives of courage and manliness. Highest of all stood the philosophers and rulers of society, by virtue of their approaching nearest to the knowledge and practice of wisdom. Such are in brief the most essential features of Plato's ideal State, and by these his theory of education is naturally determined. From the first to the tenth year education, according to Plato's view, should be chiefly physical, giving the child a sound body by gymnastic training, while his higher faculties are developed by the oral narration of suitable stories, myths, legends, fables, &c. From the tenth to the twentieth year the youth is taught reading and writing, poetry, music, and mathematics, and is put through a course of military drill and discipline. Most men have not the faculty to advance beyond this stage to any higher knowledge, but there is a minority who are capable of more advanced attainments in true philosophy. After studying to their thirtieth year the less capable of the minority will be fitted for administrative functions in the State, while the most gifted should study dialectics or philosophy five years longer, in preparation for superior offices. For fifteen years the latter should then be employed as com-

manders or managers in different departments of government. Finally, at the age of fifty Plato deemed the citizen-philosopher fitted at length for the contemplation and study of the highest good, an occupation which he would at times have to interrupt, in order to discharge the active duties of the highest and most responsible positions in the State. After the death of Dionysius, Plato made two journeys to Sicily, and attempted practically to realise his ideal State at Syracuse, but his efforts proved fruitless. If, according to modern notions, Plato's scheme appears fantastic and impracticable, his fundamental views on human education and perfection bear great resemblance to Christian doctrine, and his writings abound in profound truths, observations, and reflections bearing on the development of the faculties of human nature.

Play.—Play is commonly defined as activity carried on for the sake of the pleasure which attends it, and not of any ulterior object. As a variety of action, play is marked off from work and all serious occupation by its spontaneity, its freedom, and its want of the serious attitude which accompanies the latter. Play includes the exercise of limb and of mental faculty, so far as this is spontaneous, and not consciously subordinated to the ends of efficiency and growth. As Schiller and Mr. Spencer have shown, play is closely allied to art-activity. From this definition it is evident that much of children's activity is playful. This applies to their spontaneous bodily movements, as well as to their well-recognised varieties of play or games. It has been pointed out by Mr. Spencer that much of children's play is imitative of the actions of adults, and may be viewed as an anticipation of the functions of mature life. The region of play is an important field of observation for one who wishes to study the characteristics of childhood. It has moreover its educational uses. This applies to all games that exercise the muscular organs and the senses, and those that call into action the mental faculties. The well-known class of social games, again, which involve a measure of organisation and a common submission to rules, are of undoubted value as an aid to moral education. The educator has something to do both in the way of restraining and in guiding the play-impulses of children. An absorbing passion for games and any degree of interest in them incompatible with necessary work must be strenuously opposed. On the other hand, the play-impulse may be directed into new and healthier channels, and so its value as a source of pleasure increased. Any such control, since it tends to destroy the spontaneity which is of the essence of play, should be attempted with much caution and judgment. The question how far it is possible to regulate the play-impulse for educational purposes has been much discussed in connection with the Kindergarten system of Froebel. (On play, toys, and games, *see* Locke, *Thoughts*, § 130, and Mr. Quick's note; Maria Edgeworth, *Practical Education*, chap. i.; Beneke, *Erziehungs- und Unterrichtslehre*, §§ 23, 24; Waitz, *Allg. Pädag.* §10; Pfisterer, *Pädagogische Psychologie*, § 15. *See* also the article 'Spiel' in Schmidt's *Encyclopädie*.)

Playfair Registration Bill. *See* REGISTRATION OF TEACHERS.

Playground. *See* ARCHITECTURE OF SCHOOLS.

Pleasure and Pain.—This is the fundamental contrast which runs through all our emotional experiences. Our pleasures and pains are either bodily, as those connected with hunger and its satisfaction, or mental, as those of intellectual activity. Pleasure is the proper attendant of all normal activities which further life, whereas pain, in most cases at least, is a sign of over-activity, or of the need of activity. The educator seeks to invest study with pleasure, partly because we ought all to promote pleasure rather than its opposite, and partly because we can only be sure that intellectual activity is healthy, and consequently efficient, when it is pleasurable. (*See* article CHEERFULNESS.) While, however, pleasure has thus in general to be sought by the educator, he must not shrink, when occasion requires it, from familiarising the young mind with painful experiences. This may be necessary for intellectual progress, for we are not as yet able to carry out Locke's agreeable idea of transforming study into delightful play. And it is still more needed for moral progress. The stimulus of pain is required to call forth all the energy of the will, a fact illustrated in all wise and efficient punishment. Not only so, it is a part of the work of the moral educator to exercise the will in facing and enduring pain.

(*See* COURAGE.) (*See* Locke, *Thoughts*, § 73 and following; Sully, *Teacher's Handbook*, ch. xvi.)

Plötz. *See* MODERN LANGUAGES.

Poetry. See ENGLISH.

Political Economy is the science which treats of the production, distribution, exchange, and consumption of wealth. From the teacher's point of view this definition shows the natural divisions of the subject, about in the order in which they should be handled. Consumption is but slightly treated by most economists, thus leaving almost the whole available resources of the teacher to be devoted to the other three. The leading thought, around which all economic exposition should be grouped, may be discovered on analysis of the complex idea of wealth. The human being has many wants. Some of these are satisfied without any exertion of his own, such as the want of air and sunshine. Others there are for whose satisfaction he must toil; and the means of satisfying such wants may, when obtained, be described as Wealth. Here, then, we have the key-thought for a deductive exposition of economics, 'Want and its Supply.' The tracing out of this leading thought must of course vary much with the age and capacity of the pupils. For very young pupils the early lessons in economics are almost identical with object-lessons. The facts that when it rains we *want* a house to shelter us, that when it is cold we *want* a fire to warm us, are readily apprehended by quite young children; and when so apprehended the skilful teacher will have little trouble in getting the pupil to notice for himself how many men must have helped one another in constructing the house, or in bringing us the lump of coal now blazing in the grate. The whole skill of the teacher should be exerted, especially with young pupils, to provide copious, striking, and picturesque illustrations of this great fundamental necessity of social life, that men must help one another. This having been fully realised, a classification may be entered upon of the degrees of this help and of the circumstances of its rendering. When many men help one another in doing exactly the same thing, as in pulling at one rope, we have Simple Co-operation. When we aid one another in doing quite different things, as bakers and butchers do, we arrive at Complex Co-operation; and when we have different people doing different parts of the same thing, as when different men make different parts of a watch, their mutual help has reached its highest development, and goes by the name of Division of Labour. The advantages and disadvantages of this division of labour can now be examined, and as soon as its advantages are seen to enormously outweigh its drawbacks, the foundation can be laid for the future full investigation of Free Trade. For even thus early it may be shown that the burden of proof lies heavily on those who, allowing that division of labour is a good as between man and man, city and city, county and county, would yet deny its benefit as between country and country. Pupils who are of age and knowledge enough are generally much interested to find themselves at this early stage of their economic studies in possession of material enough for framing at all events a first opinion on one of the greatest controversies of the day. But next it may be pointed out that men labouring and helping each other in that labour can do but little unless other men have already laboured before them. Labour requires tools to work with and materials to work upon: in other words, it requires *Capital*, whose nature, kinds, and uses should be now explained. The devices adopted for obtaining capital enough for large undertakings may now be explained, and will naturally lead the way to a comparison of joint-stock and individual management, a question which may be treated as widely as may seem desirable, since the idea of joint-ownership of the means of production, as in a company, may be extended in such a way as to include something of a first statement of the meaning and aims of Socialism. And the materials on which man labours may now be traced to their origin in the earth we inhabit. We have placed the pupil in a position to estimate the exhaustiveness of the enumeration of Labour, Capital, and Land as the *requisites of production*. This investigation over, a return to first principles becomes necessary, and the leading idea of *want* must now be used comparatively and historically—the man of to-day differing from the man of long ago, and the civilised man of to-day differing from the savage of to-day in the number and complexity of his wants. Hence, economically, Civilisation will mean wanting many things and getting

them, and Progress will imply wanting more and more things and getting them. And since, in order to obtain anything we require labour, capital, and land, progress must imply increase of labour, of capital, and of produce from land. Here we are face to face with the investigation of the greatest of economic laws, and the law of the increase of labour, the law of the increase of capital, and the law of the increase of land-produce (or law of Diminishing Return) should not be left until thoroughly mastered. The last in particular, great central law as it is, the very keystone of the economic arch, is too often passed over by economic teachers in a way which leaves with the pupil no realisation of its enormous importance. These laws having been carefully investigated separately should then be combined and their united results examined; which accomplished, the treatment accorded to Production, or the first branch of economics, may be considered complete. A similar method of treatment should be accorded to the remaining divisions of economics, the teacher throughout aiming to tell the pupil as little as may be of economic laws and principles, displaying his information to his pupils only by means of his copious examples and command of illustrative facts, and endeavouring always to lead his pupil along some such path as an original discoverer might have been supposed to travel. One or two cautions it seems very necessary to offer to young teachers of economics. In the first place, the subject is exposed in a peculiar degree to the danger of a 'fatal facility.' The subject-matter of economic science is the everyday life of all of us, and not only does every man think himself fully qualified to pass opinion upon it with or without preparation, but all pupils are apt to assent at first to almost any proposition in economics put before them by the teacher, under the impression that it is quite obvious and has always been familiar. Hence the existence of much of that 'after-dinner' economy which does so much to bring the science into disrepute; and hence, also, endless confusion of thought in the student, unless the habit of too ready assent is rigorously eradicated by the teacher A good means to this end, but one requiring judicious use, is to obtain now and then the pupil's assent to some economic blunder, and then expose that blunder by the process of *reductio ad absurdum*. Another caution is that the language used cannot possibly be too simple. The economics that cannot be put into plain language, with short words, is bad as science. An elaborate terminology should be rather the mental shorthand of the trained economist than the tool of the explorer, whose character the junior student should be encouraged to assume.

'Poll' Degree. *See* DEGREES.

Port-Royalists. *See* JANSENISTS.

Portugal, University of. *See* UNIVERSITIES.

Praise and Blame.—These constitute one of the most natural and proper means of influencing children's actions, and moulding their moral character. The child is in general very sensitive to the good opinion of others. As Locke puts it, 'they find a pleasure in being esteem'd and valu'd, especially by their parents and those whom they depend on.' An infant shows the germ of this love of approbation when it turns to its mother for an approving recognition of some little feat. On the other hand, the withholding of such approval, or the manifestation of disfavour, is a source of pain. This susceptibility in relation to others' good opinion, and to what Locke calls reputation, is only one phase of children's dependence on others. The educator has to make use of this desire for others' commendation, especially in the early stages of education. Before the child can itself judge what is right, and before the love of goodness is sufficiently strong, praise and blame are a valuable means of prompting and guiding its actions. Care must, however, be taken not to resort to either in excess. Lavish praise bestowed on actions which have little moral value is injurious. Commendation of what is meritorious and in excess of bare duty must be distinguished from the colder approval which is proper to the fulfilment of this last. On the other hand, too frequent censure is apt either to lose its sting by familiarity, or to discourage and embitter the child. Finally, it should be remembered that praise and blame have only a subordinate and temporary function in moral education. It is not well that the child lean too much on others' favourable opinion. (*See* VANITY.) It should be the object of the educator to exercise the child in the discrimination of valuable from valueless commendation, and gradually to lead off its thoughts from the approbation

itself to the moral standard which determines it. In other words, the child should be led to do what is right for its own sake, and to find its highest satisfaction in an enlightened self-approval. (*See* Locke, *Thoughts*, § 57 and following; Bain, *Education as a Science*, p. 79, &c.; Sully, *Teacher's Handbook*, p. 384, &c.; Beneke, *Erziehungs- und Unterrichtslehre*, § 61.)

Preceptors, College of.—This institution was founded in 1846, mainly through the efforts of the late Mr. Stein Turrell, a schoolmaster of Brighton, and received three years later a Royal Charter of Incorporation. In this charter the object of the College is set forth as being 'to promote sound learning and to advance the interests of education, more especially among the middle classes, by affording facilities to the teacher for the acquiring of a sound knowledge of his profession, and by providing for the periodical session of a competent board of examiners to ascertain and to give certificates of the acquirements and fitness for their office of persons engaged in or desiring to be engaged in the education of youth, particularly in the private schools of England and Wales,' &c. In order to carry out this, the original aim of the College, the council has instituted three classes of examinations for teachers (of either sex), and gives three corresponding diplomas, viz. those of A.C.P., L.C.P., F.C.P., *i.e.* Associate, Licentiate, and Fellow of the College of Preceptors, the standard for the latter two being that of pass and honour degrees respectively; but, in addition, every candidate for a preceptor's diploma must pass a satisfactory examination in the 'Theory and Practice of Education,' and it is this which distinguishes the College examinations from those of other examining bodies. With a view to encouraging the study of education as a science, and in order to afford systematic instruction in pedagogy, the council of the College founded a professorship of the *Science and Art of Education*; this was then (1873) the only one of its kind in England, and its first holder was the late Professor Payne (*q. v.*), whose valuable educational library is now the property of the College. Courses of lectures are now held every session on various subjects connected with the science of education, the services of specialists being secured for the purpose; while, in addition, the members meet monthly, and read papers, and discuss educational questions, reports of their proceedings being published in the College organ, the *Educational Times*. But the main business of the College is one which the founders of the society had evidently not foreseen, viz. the examination of pupils. Every half-year examinations are held at various local centres throughout the country, and certificates of three classes (the classes being themselves further subdivided) are awarded to the successful candidates. These certificates at one time were much looked down on, as being gained with extreme ease; but the examination has been gaining every year in public favour, and there is no doubt that the certificates now carry considerable weight, the first class being about equivalent to London University Matriculation, or Oxford or Cambridge Senior Local, the second to the Junior Local, &c. Moreover, it must be remembered that the College was the pioneer in the matter of examination of schools by an external corporation, as they were some years before both the University Local and the Society of Arts examinations. Some idea of the magnitude of their operations may be obtained when it is said that (in 1887) about 15,500 pupils were examined; while it is claimed that 'more than 4,000 schools, both public and private, in all parts of the country are now brought under the influence of the College examinations.' Remembering that the government of the College is in the hands of a council which includes many of the most eminent teachers and educationists of the time, and that the College examiners are for the most part men of eminence in their own departments of learning, and that its operations are with girls' as well as boys' schools, it must be admitted that this institution has been a powerful agent in assisting the advance which has taken place in education and educational matters during the last few decades.

Precocity.—By a precocious child we understand one whose mental powers are developed in advance of his age. Precocity is thus tantamount to rapid development. It may show itself in some special direction, as in the case of the born musician, artist, or poet, or as exceptional advancement in intellectual power as a whole, as in more than one instance of famous juvenile scholarship. As already suggested, intellectual greatness has frequently foreshadowed itself by precocity.

A large proportion of famous men were remarkable in youth, if not in childhood. At the same time precocity is no guarantee of lasting intellectual power. A rapid development seems to mean in many cases a quickly arrested development. Hence the low opinion held of precocity by classical as well as by modern writers. Enough has been said to show the special educational difficulties in dealing with the precocious child. As something exceptional, he cannot easily be fitted into rules and methods intended for the average mind. The educator must recognise intellectual forwardness, and not attempt to force superior abilities into a too narrow and cramping mould. At the same time he must be alive to the dangers of a rapid mental and cerebral development, and distinctly discourage a clever boy or girl from such a rate of advance beyond the standard of its years as would be detrimental to the proper growth of the physical powers (*see* OVERPRESSURE), and so to a healthy and prolonged process of mental improvement (cf. article ORIGINALITY). (*See* article 'Frühreife' in Schmidt's *Encyclopädie*.)

Prelections (Extra-Academical). — The following are the principal endowed lectures in Great Britain, which, whether in connection with a university or not, are in their nature essentially extra-academical. They have a legitimate claim to a distinctive place in these pages, because their aims and purposes, however diverse in other respects, are at least identical in their intention to favour the spread and development of education. A large proportion of them are intended and calculated to aid in the formation of precise and definite opinions in religion, whether in the direction of a dogmatic theology, or of an equally pronounced latitudinarianism which regards all religions as evolved phenomena, and their origin and development as legitimate objects of historical investigation and of philosophical and critical exposition. But in secular learning, also, the lectures, in their scope and aggregate, are well-nigh encyclopædic.

The *Baird Lectures* owe their foundation to the late Mr. James Baird, of Gartsherrie, a munificent benefactor to the Church of Scotland, who died in June 1876, having, at the meeting of the General Assembly of the Church of Scotland in 1872, declared his intention to institute a lectureship, to be called 'the Baird Lecture,' for the illustration and the defence of the vital truths of Christianity, as well as 'for the promotion of Christian knowledge and Christian work generally, and for the exposure and refutation of all error and unbelief.' In the deed of trust thereafter executed by Mr. Baird his trustees were directed 'to hold an annual sum of 220*l.* out of the revenue of the funds under their charge for the purpose of said lectureship.' The Baird lecturer must be a minister of the Church of Scotland, or of any of the Scottish Presbyterian Churches, of not less than five years' standing in the cure of a parish or the pastorate of a congregation, a 'man of piety, ability, and learning, and who is approved and reputed sound in all the essentials of Christian truth.' The appointment of the lecturer is directed to take place annually in the month of April, 'at a meeting of the trustees to be called for the purpose, and held in Glasgow.' It is the duty of the lecturer to 'deliver a course of not less than six lectures on any subject of theology, Christian evidences, Christian work, Christian missions, Church government, and Church organisations, or on such subject relative thereto as the trustees shall from year to year fix in concert with the lecturer. The lectures shall be duly advertised to the satisfaction of the trustees at the cost of the lecturer, and shall be delivered publicly at any time during the months of January and February in each year in Glasgow, and also, if required, in such other one of the Scottish university towns as may from time to time be appointed by the trustees.' The first series of the Baird Lectures was delivered by the Rev. Robert Jamieson, D.D., minister of St. Paul's Parish Church, Glasgow, and moderator of the General Assembly, 1872, in which Mr. Baird first declared his intention of founding his lectureship.

The *Bampton Lectures* were founded by the Rev. John Bampton, M.A., sometime of Trinity College, Oxford, canon of Salisbury, who died in 1751, leaving a will in which he bequeathed his 'lands and estates to the chancellor, masters, and scholars of the University of Oxford for ever,' for 'the endowment of eight divinity lecture sermons, to be established for ever in the said university,' and to be preached every year at Great St. Mary's. The 'eight divinity lecture sermons' thus endowed are preached on as many Sunday

mornings in full Term, 'between the commencement of the last month in Lent Term and the end of the third week in Act Term, upon either of the following subjects: to confirm and establish the Christian faith, and to confute all heretics and schismatics, upon the divine authority of the Holy Scriptures, upon the authority of the writings of the primitive fathers as to the faith and practice of the primitive Church, upon the divinity of our Lord and Saviour Jesus Christ, upon the divinity of the Holy Ghost, upon the Articles of the Christian Faith as comprehended in the Apostles' and Nicene Creeds.' The lecturer, who must be at least a Master of Arts of Oxford or Cambridge, is chosen annually by the heads of colleges on the fourth Tuesday in Easter Term. No one can be chosen a second time. Although the founder died in 1751 his bequest did not take effect until 1780, when the first course of the Bampton Lectures was delivered by the Rev. James Bandinel, D.D., of Jesus College, and public orator of the university.

The *Barlow Lectures* are so named after their founder, the late Henry Clark Barlow, M.D., a large proportion of whose life was consecrated to the study of Dante, and who was the author, *inter alia*, of a laborious work entitled *Critical, Historical, and Philosophical Contributions to the Study of the Divina Commedia.* Dr. Barlow, who died in November 1876, left by will 1,000*l.* Consols to University College, London, for the delivery of an annual course of twelve lectures on the *Divina Commedia*, which should be open to the public of both sexes free of charge. He also arranged that every lecturer who should be appointed might hold the lectureship for three years; the manifest intention being that the three cantica of Dante's great poem might form the subject of the three years' course. The introductory lecture to the first of these courses was delivered at University College by Mr. Charles Tomlinson, F.R.S., on April 25, 1878.

The *Boyle Lectures* were instituted in conformity with instructions contained in a codicil, dated July 28, 1691, annexed to the will of the Hon. Robert Boyle (seventh son of Richard, the 'great Earl of Cork'), one of the founders of the Royal Society, and a man of attainments so extraordinary as to be described as being 'superior to titles and almost to praise.' Mr. Boyle's object, as expressed in his own words, was to provide 'an annual salary for some learned divine, or preaching minister, from time to time to be elected and resident within the city of London, or circuit of the bills of mortality, who shall be enjoined to perform the offices following: viz., first, to preach eight sermons in the year for proving the Christian religion against notorious infidels—viz., Atheists, Theists, Pagans, Jews, and Mahometans, not descending lower to any controversies that are among Christians themselves; these lectures to be on the first Monday of the respective months of January, February, March, April, May, September, October, November, in such church as my trustees herein named shall from time to time appoint. Secondly, to be assisting to all companies, and encouraging of them in any undertaking for propagating the Christian religion to foreign parts. Thirdly, to be ready to satisfy such real scruples as any may have concerning these matters, and to answer such objections or difficulties as may be started to which good answers have not yet been made.' The Boyle Lectures are delivered at the church of St. Mary-le-Bow, and the first course was preached in 1692 by the celebrated Dr. Bentley, who delivered a second course in 1694. Mr. Boyle died December 30, 1691.

The *Cantor Lectures*, in connection with the Society for the Encouragement of Arts, Manufactures, and Commerce ordinarily known as the Society of Arts, receive their designation from their founder, the late Theodore Edward Cantor, M.D., of Her Majesty's Indian Medical Service. Dr. Cantor, who by his will, dated March 3, 1859, appointed the administrator-general of Fort William to be his executor, bequeathed his property, of the value of over 10,000*l.*, in equal shares to the Wellington College, Wokingham, and the Society of Arts, declaring it to be his desire that the moneys so given should be applied by the governors of the college and by the president of the Society of Arts in such manner as they might deem most conducive to promote the objects of the college and the society. Under the terms of the Cantor bequest, amounting to 5,042*l.*, invested in the purchase of Indian securities, it became the duty of the council to make some special appropria-

tion of the fund towards the promotion of arts, manufactures, and commerce, and they determined to apply a portion of the interest of the fund for the society's session of 1863–4 in providing, at an estimated cost of 150*l*., three courses of lectures by eminent men on the following subjects:—(1) International Commerce; (2) Chemistry applied to Manufactures; and (3) Industrial Art. Accordingly, the first course of Cantor Lectures, four in number, which were delivered by Mr. G. W. Hastings, a barrister of the Middle Temple, and now M.P. for East Worcestershire, respectively on December 7 and 14, 1863, and January 25 and February 1, 1864, had for their subject 'The Operation of the Present Laws of Naval Warfare on International Commerce;' the second course of lectures, seven in number, on 'Fine Arts applied to Industry,' were delivered by Mr. W. Burges on consecutive Monday evenings, beginning with February 8 and concluding on March 21; and Dr. F. Crace Calvert, F.R.S., F.C.S., &c., delivered a third course, of six lectures, on 'Chemistry applied to the Arts,' on Thursday evenings, beginning on March 31 and ending on May 5, 1864. From the first session of their institution the Cantor Lectures have been characterised by the same diversity and catholicity of interest as are presented in the aggregate proceedings, scope, and purposes of the society under whose auspices, and in the theatre of whose house, John Street, Adelphi, they are delivered.

It will have been seen that the lectures of the three several courses of the first session of their delivery amounted altogether to seventeen; and it remains that the average number of lectures, whatever their distribution or grouping into courses may be, is estimated at about eighteen for the entire session—a session which, beginning in November, runs on to May of the following year. The Cantor Lectures are open to members of the Society of Arts free of charge, and a member has the privilege of introducing one friend to each lecture. On receiving the intimation of the Cantor Bequest, the council of the society placed on record their peculiar gratification in being selected to enjoy a moiety of the benefactions of a gentleman who was not known to have ever been on their list of members, which they further regarded as a pledge of the interest taken in their proceedings by their fellow-countrymen all the world over.

The *Congregational Lectures* were instituted in 1833—when the first series was delivered by the late Rev. Ralph Wardlaw, D.D.—by the committee of the Congregational Library, 'to be delivered annually at the library, or, if necessary, in some contiguous place of worship,' and to partake 'rather of the character of *academic prelections* than of popular addresses' The design was to provide 'courses of lectures on subjects of interesting importance, not included within the ordinary range of pulpit instruction. To illustrate the evidence and importance of the great doctrines of Revelation; to exhibit the true principles of philology in their application to such doctrines; to prove the accordance and identity of genuine philosophy with the records and discoveries of Scripture; and to trace the errors and corruptions which have existed in the Christian Church to their proper sources, and, by the connection of sound reasoning with the honest interpretation of God's Holy Word, to point out the methods of refutation and counteraction, are amongst the objects for which the Congregational Lecture has been established. The arrangements made with the lecturers,' continues the *Advertisement of the Committee of the Congregational Library*, dated November 19, 1833, 'are designed to secure the publication of each separate course without risk to the authors; and, after remunerating them as liberally as the resources of the institution will allow, to apply the profits of the respective publications in aid of the *Library*.'

The *Congregational Union Lectures*, a resumption or continuation of the above after an abeyance of several years, were established in 1873, when the lecturer was the late Henry Rogers. The *Advertisement by the Committee of the Congregational Union of England and Wales*, dated January 1874, declares that 'the Congregational Union Lecture has been established with a view to the promotion of Biblical science and theological and ecclesiastical literature. It is intended that each lecture shall consist of a course of prelections, delivered at the Memorial Hall, but when the convenience of the lecturer shall so require the oral delivery will be dispensed with. The committee hope that the lecture will be maintained

in unbroken annual series; but they promise to continue it only so long as it seems to be efficiently serving the end for which it has been established, or as they may have the necessary funds at their disposal.'

The *Croall Lectures* are named after their founder, the late Mr. John Croall, of Southfield, Liberton, Midlothian, who died in 1872, and who, being 'deeply interested in the defence and maintenance of the doctrines of the Christian Religion, and desirous of increasing the religious literature of Scotland,' bequeathed in the hands of trustees the sum of 5,000*l.* sterling, 'to found and establish a Lectureship, to be called "The Croall Lectureship."' The trustees, according to Mr. Croall's settlement, are certain ministers in Edinburgh, the Professors of Divinity in the University of Edinburgh, and the Moderator, Senior Clerk, and Procurator of the Church of Scotland. The lecturers 'shall be Licentiates of the Presbyterian Churches of Scotland,' and occasionally a clergyman of any Reformed Church other than Presbyterian, 'provided such appointment be made by at least two-thirds of the trustees.' The Lectures shall be delivered biennially in Edinburgh during the winter session of the University of Edinburgh, 'shall be not less than six in number,' and shall be devoted to a consideration of the Evidences of Natural and Revealed Religion and the Doctrines of the Christian Religion. The first series of the Croall Lectures, on the 'Christian Doctrine of Sin,' was delivered in 1876 by the late Very Reverend John Tulloch, D.D., Principal of St. Mary's College in the University of St. Andrews, and one of Her Majesty's Chaplains for Scotland.

The *Cunningham Lectures* were founded in 1862 by William Binny Webster, a sometime surgeon in the H.E.I.C.S., who made over to the general trustees of the Free Church of Scotland the sum of 2,000*l.*, in trust for the purpose of endowing a lectureship in memory of the Rev. William Cunningham, D.D., Principal of the Free Church College, Edinburgh, and Professor of Divinity and Church History therein, who died December 14, 1861, after whose name the lectures are called. They are for the general purpose of 'advancing the theological literature of Scotland,' and the lecturer must be a minister or professor of the Free Church of Scotland; with an occasional appointment of a minister or professor from other denominations by the consent of not fewer than eight members of the council. The appointment cannot be for less than two years or for more than three, and the lecturer is 'at liberty to choose his own subject within the range of apologetical, doctrinal, controversial, exegetical, pastoral, or historical theology, including what bears on missions, home and foreign, subject to the consent of the council.' The lectures, not less than six in number, must be delivered at some time immediately preceding the expiry of the appointment of the lecturer, and during the session of New College, Edinburgh, and in the presence of the professors and students of that institution. The council, which includes the principal of New College, *ex officio*, and two annually elected members of the Senatus, the moderator of the Free Church General Assembly, *ex officio*, and five members annually chosen by that body, the procurator or law adviser of the Church, and others, have been at liberty, since the expiry of five years from the date of the foundation of the lectures, 'to make any alteration that experience may suggest as desirable in the details of this plan, provided such alterations shall be approved by not fewer than eight members of the council.'

The *Duff Lectures*, known more precisely as the Duff Missionary Lectures, were instituted under the provisions of the will of the late Rev. Alexander Duff, D.D., for many years a prominent missionary in India, at first as minister of the Established Church of Scotland, and afterwards, from 1843, of the Free Church. During a visit to Scotland Dr. Duff was called by acclamation to be moderator of the Free Church General Assembly which met in 1851; and the distinction was repeated in 1873. On his final return from India, on account of ill-health, in 1863, Dr. Duff was elected to the first professorship of Evangelistic Theology—a characteristically missionary chair—in the New College, Edinburgh, which, as well as the convenership of the Foreign Missions Committee of the Free Church, to which he was appointed about the same time, he held until his death, February 12, 1878. 'Desirous in death to secure the completion of his missionary propaganda, Dr.

Duff,' in the words of his biographer, Dr. George Smith, 'bequeathed to trustees selected from all the Evangelical churches what personal property he had as the foundation of a lectureship on Foreign Missions, on the model of the Bampton.' In the arrangements he made for the establishment of the Duff Missionary Lectureship the founder's son, Mr. William Pirie Duff, complied with the dying instructions of his father, only deviating therefrom to the extent of designating the lectureship by his father's name. In terms of a trust-deed executed by Mr. Duff a course of lectures, not fewer than six in number, 'On some department of Foreign Missions or cognate subjects,' is to be delivered once in every four years, each lecturer to give only one course. They are to be delivered in Edinburgh and repeated in Glasgow, or delivered in Glasgow and repeated in Edinburgh, or delivered and repeated in such other places as the trustees may direct. The lectures are then to be published, and copies are to be presented to certain libraries in this country, continental Europe, America, India, Africa, and Australia. The trustees, in accordance with the direction of the founder, are men belonging to different denominations, and the lecturer must be 'a minister, professor, or godly layman of any Evangelical church.' The first incumbent of the Duff Missionary Lectureship was the Rev. Thomas Smith, D.D., who had been long associated with Dr. Duff in mission work in Bengal, and afterwards in the home management of the missions of the Free Church of Scotland, and who was his successor in his college professorship of Evangelistic Theology. The subject chosen by Dr. Smith for treatment in the first series of the Duff Lectures, which were delivered in 1880, was 'Mediæval Missions;' and the practical conformity of the trustees to the formal catholicity of the foundation is approved by the circumstance that the lecturer for the current year, 1888, was Sir Monier Monier-Williams, D.C.L., the Boden Professor of Sanskrit in the University of Oxford, the subject of whose discourses was the, to him, familiar one of Buddhism.

The *Fernley Lectures* are so named after their founder, the late John Fernley, Esq., of Southport, a munificent benefactor to various schemes of Methodist activity. These lectures, which are of annual recurrence, are delivered 'in connection with the assembling of the Wesleyan-Methodist Conference,' and in the cities or towns, therefore, at which the conference holds its successive annual meetings. They were instituted 'for the purpose of explaining and defending the theological doctrines or the ecclesiastical polity of the Wesleyan-Methodist Connexion, with special reference and adaptation to the necessities of the times, and with a view to the benefit of the candidates who are about to be ordained by the Conference to the ministry, and also the laymen who usually attend the Conference committees.' The first of the Fernley Lectures was delivered at Hanley, Staffordshire, by the Rev. George Osborn, D.D., in 1870.

The *Gifford Lectures* are so named after their founder, Lord Gifford, a judge of the Court of Session, Edinburgh, from 1870 to 1881, when he retired from the Bench. They are substantially endowed from the interest of a very considerable sum of money bequeathed for the purpose; and they are founded in connection with each of the four Scottish Universities, St. Andrews, Glasgow, Aberdeen, and Edinburgh. The lectures are to be devoted to an exposition of 'Natural Religion, in the widest sense of that term;' and the lecturers are to 'be subjected to no test of any kind,' and 'may be of any denomination whatever, or of no denomination at all.' The lecturers hold their appointments for two years, but they may be reappointed for other two periods of two years each; but no person can hold the lectureship longer than six years. The appointment of the first Gifford Lecturer took place on March 14, 1888, when Mr. Andrew Lang was elected by the Senatus of the University of St. Andrews, with a view to the performance of his duties, since fulfilled, during the academical session of 1888-89; and subsequently, with the like intention, the universities of Glawgow, Edinburgh, and Aberdeen elected Professor Max Müller, Dr. James Hutchison Stirling, and Dr. E. B. Tylor to their respective lectureships on the Gifford foundation. The conditions of the incumbency of these lectureships are, as already mentioned, as large and unfettered as can readily be imagined.

The *Gresham Lectures*, as well as the college in which they are delivered, are

so called after their founder, Sir Thomas Gresham, the 'Royal Merchant' of Queen Elizabeth. By his will, dated July 5, 1575, Sir Thomas bequeathed certain rents growing out of the Royal Exchange—which he built—in trust severally to the Corporation of the City of London, and to the masters and wardens of the Mercers' Company, for the 'erecting and maintaining of divers lectures in sundry faculties' —divinity, law, physic, geometry, astronomy, music, and rhetoric. He also left for the professors who should be appointed under his will his house in Bishopsgate Street, with its gardens and other appurtenances, 'for them and every of them there to inhabite, study, and daylie to read the said severall lectures.' He enjoined that the lecturers should be unmarried at the time of their appointment, and also that marriage subsequently contracted should void their preferment. This injunction, after many years of neglect or abeyance, was formally set aside by Act of Parliament. The bequest of Sir Thomas Gresham, who died November 20, 1579, did not come into effect until the death of his widow, Dame Anne Gresham, in December 1596; and the lectures were organised and commenced in June 1597. The buildings of Gresham College were pulled down in 1768, and the General Excise Office erected on the site, the property having been acquired by the Crown for an annuity of 500*l*. From that time and for many years the lectures were read in a room over the Royal Exchange; and finally, in November 1843, they were removed to the present building in Basinghall Street, which had been erected by the Gresham committee as the headquarters of the college.

The *Hibbert Lectures* are one of the particular expressions of the wish of the Hibbert trustees to carry out the will of the late Mr. Robert Hibbert, who died in September 1849, after bequeathing a sum of money with directions that the income should be applied in a manner indicated in general terms by him, but with large latitude of interpretation to the trustees. For many years the trustees appropriated their funds almost entirely to the higher culture of students for the Christian ministry, thus carrying out the instruction to adopt such scheme as they 'in their uncontrolled discretion from time to time' should deem 'most conducive to the spread of Christianity in its most simple and intelligible forms, and to the unfettered exercise of private judgment in matters of religion.' In succeeding years other applications of the fund were suggested to the trustees, some of which have been adopted. One of the latest has been the institution of a Hibbert Lecture on a plan similar to that of the 'Bampton' and 'Congregational' Lectures. The institution of the lectures was the immediate result of a memorial addressed to the trustees 'by a few eminent divines and laymen belonging to different churches,' but united in a common desire for the 'really capable and honest treatment of unsettled problems in theology.' 'From the fact,' say the subscribers of this memorial, 'that all the chief divinity schools of this country are still laid under traditional restraint, from which other branches of inquiry have long been emancipated, the discussion of theological questions is habitually affected by ecclesiastical interests and party predilections, and fails to receive the intellectual respect and confidence which are readily accorded to learning and research in any other field. There is no reason why competent knowledge and critical skill, if encouraged to exercise themselves in the disinterested pursuit of truth, should be less fruitful in religious than in social and physical ideas; nor can it be doubtful that an audience is ready to welcome any really capable and honest treatment of unsettled problems in theology. The time, we think, is come when a distinct provision for the free consideration of such problems by scholars qualified to handle them may be expected to yield important results. . . . Such institutions as the Bampton Lecture at the University of Oxford, and the younger foundation of the Congregational Lecture among one branch of orthodox Nonconformists, have done much to direct the public mind to certain well-defined views of Christianity. We believe that a similar institution might prove of high service in promoting independence of judgment combined with religious reverence by exhibiting clearly from time to time some of the most important results of recent study in the great fields of philosophy, of biblical criticism, and comparative theology. We venture, therefore, to ask you to consider the expediency of establishing a "lecture" under the name

of the "Hibbert Lecture," or any other designation that may seem appropriate.' The practical answer to this memorial was the institution of the Hibbert Lectures, the first series of which was given in April, May, and June 1878, by Professor Max Müller, in the Chapter House of Westminster Abbey. Of late years the lectures, which from their earliest establishment have been of annual occurrence, have been delivered concurrently, but on different days of the week, in London and Oxford.

The *Hulsean Lectures* were instituted in conformity with the will of the Rev. John Hulse, of Elworth, Cheshire, a sometime member of St. John's College, Cambridge (B.A. 1728), who died at the age of 82 on December 14, 1790. Mr. Hulse bequeathed his estates to the University of Cambridge, first, to maintain two scholars at St. John's College; secondly, to found a prize for the best dissertation upon some subject connected with the direct or collateral evidences of the Christian revelation; thirdly, to found and support the office of Christian advocate, for which, by a statute confirmed by the Queen in Council, August 1, 1860, was substituted that of the Hulsean professor of divinity; and fourthly, that of Christian preacher, more familiarly known by its alternative designation of Hulsean lecturer, which was considerably modified by the statute and Order in Council just referred to. By Mr. Hulse's will, dated July 21, 1777, it was directed that the incumbent of the lectureship, which was avowedly in pious imitation of the example of the Honourable Robert Boyle, should be a 'clergyman in the University of Cambridge, of the degree of Master of Arts, and under the age of forty years.' The lecturer was to be elected annually 'on Christmas Day, or within seven days after, by the Vice-Chancellor for the time being, and by the Master of Trinity College and the Master of St. John's College, or any two of them.' In case the Master of Trinity or the Master of St. John's should be the Vice-Chancellor, the Greek professor was to be the third trustee. The duty of the lecturer was 'to preach twenty sermons in the whole year—that is to say, ten sermons during the months of April and May and the two first weeks in June, and likewise ten sermons during the months of September and October and during the two first weeks in November.' The place of preaching was to be 'Saint Mary's Great Church in Cambridge,' and the time 'either on the Friday morning or else on Sunday afternoon.' The subject of the said discourses was to be 'the evidence for revealed religion; the truth and excellence of Christianity; prophecies and miracles; direct or collateral proofs of the Christian religion, especially the collateral arguments; the more difficult texts or obscure parts of the Holy Scriptures,' or any one or more of these topics, at the discretion of the preacher. The subject of the discourses was *not* to be 'any particular sects or controversies amongst Christians themselves; except some new and dangerous error, either of superstition or enthusiasm, as of Popery or Methodism, or the like, either in opinion or practice, shall prevail. And in all the said twenty sermons such practical observations shall be made, and such useful conclusions added, as may best instruct and edify mankind. The said twenty sermons are to be every year printed,' at the preacher's expense, 'and a new preacher elected (except in the case of the extraordinary merit of the preacher, when it may sometimes be thought proper to continue the same person for five, or at the most, for six years together, but for no longer term), nor shall he ever afterwards be again elected to the same duty.' On the petition of the Chancellor, Masters, and Scholars of the University of Cambridge it was directed by an order of the Court of Chancery, December 21, 1830, that the number of discourses required to be delivered and printed by the lecturer within the year should be reduced to eight—the number exacted from the Boyle lecturer. By more recent changes the election to the office of Hulsean lecturer now takes place on some day in February, not later than the 20th; and the duty of the lecturer is to preach during his year of office not less than four sermons, the time of the delivery of which is to be prescribed by the university. If the duties be not discharged by the person appointed, his salary is to be divided among the six senior fellows of St. John's College. The electors are the Vice-Chancellor, the Master of Trinity, the Master of John's, and the four divinity professors, the Vice-Chancellor having a casting vote; whilst the services of the regius professor of Greek as a member of the electoral body are pro-

vided for under the same contingency which was originally foreseen. Although Mr. Hulse died in 1790 it was not until 1820 that the first series of discourses was delivered, the lecturer being the Rev. Christopher Benson, who was successively of Trinity College and a fellow of Magdalene College, Cambridge, and rector of St. Giles-in-the-Fields, London, who officiated a second time in the same capacity in 1822. 'One principal reason' for this delay, observes Mr. Benson in the Preface to his *Hulsean Lectures* for 1820, 'among many others, I believe to have been this: that the proceeds of his estates were not at an earlier period sufficient to repay the preacher for the expense of printing, much less to remunerate him for the anxious labour of composing twenty discourses fit to be delivered before such an audience and afterwards submitted to the criticisms of the world.'

The *Merchants' Lecture* was established in the year 1672, during the reign of Charles II., by the Presbyterians and Independents conjointly, at Pinner's Hall, Broad Street, London. It was supported by contributions from the principal merchants of the city of London, and its professed design was 'to uphold the doctrines of the Reformation against the errors of Popery, Socinianism, and infidelity.' From Pinner's Hall it was removed in July 1778 to New Broad Street Chapel; and thence, in 1844, to the Poultry Chapel; to the Weigh House Chapel in 1869; and thence, in the spring of 1883, to Finsbury Chapel, Moorfields. The lecture is delivered on every Tuesday morning, commences at noon, and concludes at 1 p.m. There are several bequests connected with the lecture, intended in most cases for the benefit of poor ministers of the Independent denomination. There is no fund for the payment of the lecturer or for other expenses, the founders of the trusts not anticipating that there would be any difficulty in meeting the expenses so incurred.

The *Rede Lectures* are so named after their founder, Sir Robert Rede, whose name varies as Read and Reade, and who was Lord Chief Justice of the Court of Common Pleas in the reigns successively of Henry VII., of whose will he was one of the executors, and Henry VIII. He was educated at Buckingham Hall, afterwards Magdalene College, Cambridge, and became a fellow of King's Hall, on the site of which part of Trinity College was built. He died January 8, 1519, having, by an endowment which seems to have accrued to the university in 1524, established three public lectures, respectively in philosophy, logic, and rhetoric; which, together with a mathematical lecture, founded at a very early period in the history of the university, were known as *Barnaby Lectures*, from the circumstance of the lecturers being annually chosen for their several preferments on St. Barnabas's Day, June 11. The Rede Lectures were consolidated by a statute approved by Her Majesty by Order in Council, April 6, 1858; and in 1859 were replaced by an annual lecture, which it was directed should be delivered in Term time every year. The appointment of the lecturer is vested in the Vice-Chancellor, who exercises his power of election during the Lent Term in every year, and who determines the day on which the lecture, which is ordained to be given in the Senate House, should be delivered. A lecture which perpetuates in one three several lectures on philosophy, logic, and rhetoric is, of course, extremely versatile in its subjects, embracing the exposition of the latest results of research and speculation in various branches of science, art, ethics, philology, history, and archæology. The first of the Rede Lectures, as reconstructed, was delivered in 1859 by Dr. (now Sir Richard) Owen, F.R.S., who took for his subject the 'Classification and Geographical Distribution of the Mammalia.'

The *Swiney Lectures* are so called after the name of their founder, the late George Swiney, M.D., formerly of Exeter and afterwards of London, the history of whose intentions in their establishment is to be interestingly traced in the varying phrases and purposes of his testamentary benefactions. By his will, dated May 27, 1831, Dr. Swiney bequeathed '5,000*l.* stock in the Three per Cent. Consolidated Annuities to the trustees of the British Museum and their successors duly elected and appointed for ever, in trust for the purpose of establishing a lectureship on natural history.' To this will was appended a first codicil, dated November 14, 1835, which revoked the bequest, and then established a lectureship of geology; whilst a further codicil, of date April 25, 1843, made 'at my rooms in Camden Town, writing with my left hand,' sets forth that 'whereas it may-

contribute more to the interests of religion and goodness if lectures in astronomy be added to the lectures in geology, I desire that the lectureship be of geology and of astronomy alternately.' The first course of the Swiney Lectures was delivered by the late Dr. W. B. Carpenter at the Royal Institution, Albemarle Street; and except on two or three occasions, upon which the lectures have been given at Edinburgh, they have ever since been delivered in different places in London, including the Museum of Practical Geology, the Royal School of Mines, University College, and the British Museum (Natural History), Cromwell Road, South Kensington. In the last-named institution, as may be gathered from the following 'conditions of appointment,' it is at present intended by the trustees that the Swiney Lectures shall be habitually delivered. These 'conditions of appointment' set forth that 'candidates must have taken the degree of Doctor of Medicine at the University of Edinburgh. The stipend of the lecturer is 150*l.* a year. The appointment will be for a term of three years. All charges incurred for the delivery of the lectures are to be defrayed by the lecturer. The number of lectures is not to be less than twelve in each year, nor more than three in the same week, to be delivered between the 1st of November and the end of July following, at the British Museum (Natural History), Cromwell Road, South Kensington, and illustrated, when practicable, from specimens in that museum. The public to be admitted to the lectures without fee. No lecture must be repeated. The lecturer will be required at the termination of each course, and previously to receiving his annual stipend, to deposit a copy or full digest of the lectures with the director of the British Museum (Natural History). The trustees reserve to themselves the power of making any alterations which they may think fit in the foregoing conditions.'

The *Warburton Lectures*, which are annually delivered in the chapel of the Honourable Society of Lincoln's Inn, were founded by Dr. Warburton, Bishop of Gloucester, 1759–79, and a sometime preacher of Lincoln's Inn, his appointment having been made in April 1746, eight or nine years after the publication of the first edition of his celebrated treatise on the *Divine Legation of Moses*. By an indenture bearing date July 21, 1768, Bishop Warburton transferred the sum of 500*l.* Bank Four per Cent. Annuities Consolidated to Lord Chief Justices Lord Mansfield and Sir John Eardley Wilmot, and to the Hon. Charles Yorke, second son of Lord Chancellor Hardwicke—who died soon after his own appointment to the same dignity, in January 1770—upon trust, for the purpose of founding a lecture, in the form of a sermon, 'to prove the truth of revealed religion in general, and of the Christian in particular, from the completion of the prophecies in the Old and New Testaments which relate to the Christian Church, especially to the apostasy of Papal Rome.' The same deed further ordains 'that the trustees shall appoint the preacher of Lincoln's Inn for the time being, or some other able divine of the Church of England, to preach this lecture; that the lecture shall be preached every year in the chapel of Lincoln's Inn (if the Society give leave), and on the following days—viz. the first Sunday after Michaelmas Term, the Sunday next before and the Sunday next after Hilary Term; that the lecturer shall not preach the said lecture longer than for the term of four years, and shall not again be nominated to preach the same; and when the term of four years is expired, that the said lecturer shall print and publish, or cause to be printed and published, all the sermons or lectures that shall have been so preached by him.' The first series of Warburton Lectures, being *Twelve Sermons introductory to the Study of the Prophecies*, was delivered and published in 1772 by Dr. Richard Hurd, who was at that time preacher to the Honourable Society of Lincoln's Inn, and who afterwards became successively Bishop of Coventry and Lichfield (1775–81), and of Worcester (1781–1808). Dr. Hurd was the first biographer of Bishop Warburton, and the first editor of his collected works, 1788.

Prendergast's Method.—The main object of this method is to give learners, young and old, the habit of speaking a foreign language fluently, idiomatically, and with the utmost readiness, within the range of a limited vocabulary. To know a language is to be able to put its words to their natural uses; that is, to employ them in sentences. Children pick up their native tongue, and residents abroad acquire a foreign language, by imitation.

They hear words used, not singly, but in sentences; and they imitate these sentences —not in one stereotyped form, but with numerous slight variations. This is the principle on which the method is based. A set of typical sentences, containing from twenty-five to thirty words each, are selected, exemplifying the most characteristic constructions, and containing all the words most frequently used for the purpose in hand. These are accompanied by a literal translation and a free idiomatic English version of each of them. Each foreign sentence is divided into clauses of four or five words each, with their corresponding versions attached; and the sentence is mastered clause by clause till it can be repeated with utmost readiness and perfect accuracy with and without the English. Having mastered the typical sentences, we turn to their component clauses, and ring all the changes on each clause, one after the other, which are possible without changing the inflections; never letting the old clauses drop, but working them in again and again with the new. When all the sentences are used up we can add more; and now in ringing the changes on the clauses may introduce the simpler changes of inflection; and so on till our stock of words and idioms is large enough for our purpose. Attention is called to the changes in the forms of words by reference to a table of inflections, but nothing more in the way of grammar is required. Instead of grammar the learner has acquired the habit of using naturally a large number of words and idiomatic phrases, and of putting them in their right places in sentences. He may learn the grammar later if he wishes to extend and strengthen his grasp of the language; but in any case he should do much reading of authors by means of interlinear translations, on which again exercises in retranslation should be done. No better method has ever been invented for 'winding up and setting in motion the talking machinery;' and it might well be used for the first stages in learning any language, even when something more is desired than the mere power of speaking. It is a most valuable adjunct to the plan of ASCHAM (*q.v.*).

Preparation of Lessons.—Lessons may be prepared either by the pupil alone, or by the pupil under the direction of a tutor. Both of these cases are considered in the article on HOME LESSONS. The art of preparing lessons does not come by nature, and consequently a good teacher makes sure that when a lesson is set every pupil knows *one* method at least of preparing it.

Previous Examination. *See* DEGREES.

Primary Education. *See* LAW (EDUCATIONAL), ROYAL COMMISSIONS, and SCHOOL BOARDS.

Primary Schools. *See* CLASSIFICATION.

Primer.—The original meaning of this word appears to have been a 'book of prime' (or 'hours'), where *prime* denotes the first canonical hour (Skeat); we find 'prymer' coupled with 'paternoster' in *Piers Plowman*, and with 'my great masse book' in Fabyan's Will. The word, however, has gradually had its signification extended so as to cover any work dealing with the elements of any subject, so that a primer of German literature, of chemistry, or of pianoforte-playing, would mean a work dealing with each of those subjects in a manner to be understood by a learner who had no previous acquaintance with any of them, the essential of a Primer (as we now use the word) being that it deals with the subject of which it treats *ab initio*. A typical example of this class of book is the *Public School Latin Primer*, a work edited with the sanction of the chief English head-masters, and designed to be used as a first book of instruction in Latin accidence and syntax throughout the public schools.

Private Tutor. *See* TUTOR.

Private-Venture Schools.—These are schools kept by private individuals for the sake of private profit. In days gone by a large number of such schools were of a very unsatisfactory character, the teaching being mainly done by those whose only fitness consisted in their desire to gain a livelihood. But, though unsatisfactory schools have not yet entirely disappeared, matters have very much improved since the public began to take a greater interest in education, and to understand more clearly in what a sound education consists. Very few private-venture schools can now be successful for any length of time which do not in a measure satisfy many of the requirements of skilled teaching. Nevertheless, in all grades above the elementary, and even to some extent in that grade also, it is still quite possible for schools which are never really successful to maintain their existence, though the teaching

they afford may be wholly inadequate. In the elementary grade it is quite within the power of the Local School Attendance Committee to declare that the results of the instruction given at a particular school do not satisfy the requirements of the Education Acts (1870, 1876, 1880), which would practically close the school or result in its reformation. But it is possible to escape the notice of the committee; and above this grade there is no authoritative body to declare whether a school is efficient or not. It is to be hoped that before very long England will follow the example of the other great European nations, and recognise the vital importance of education in *every* grade by requiring *all* who undertake the work of teaching to satisfy some public test of *fitness to teach*; or that she will at least place those who do not satisfy such a test under distinct civic disabilities, such, for instance, as disabling them from recovering fees in a court of law. Beyond this it would not be wise to interfere with private enterprise, especially since such advance as we have made in the science and art of education has been almost entirely due to the genius and free inventiveness of private teachers; and since there must always be large numbers of children for whom the comparative quiet, homeliness, and greater personal attention of a small private school must—for at least *part* of their career—be much better suited than the bustle and expense of a large public institution.

It will be of interest to note the regulations of other countries with regard to the liberty of teaching. *Austria.*—The State reserves to itself the right of general surveillance over all educational establishments, but any one can engage in the work of education provided he or she possesses a certificate or warrant of professional fitness. *Bavaria.*—Home education is entirely free from regulations. But no one can open a private school except with the leave of the municipality, and on condition of being a Bavarian citizen, and of furnishing proof of moral and professional fitness. Private establishments are placed under the surveillance of competent authorities. *Belgium*, which has of late years retrograded considerably in educational matters, leaves education wholly unrestricted, and makes no requirement as to professional knowledge or skill. *France.*—Here all education is under the direction or surveillance of the State, and over and above municipal regulations as to the sanitary arrangements, &c., of a school, every teacher is required to produce proofs of civil, moral, and professional fitness. In *Greece* and in *Italy* the regulations are almost exactly the same as in France. This is also the case in the *Netherlands*. In *Prussia* parents and guardians are required to see that their children and wards are given the same instruction as that in the public schools. Every one has the right to give lessons or establish a school, on giving the State authorities proof of moral, theoretical, and practical fitness. All educational institutions, public or private, are under the surveillance of authorities nominated by the State. The regulations for *Saxony* do not differ much from those of Prussia, except that teachers in private schools must have diplomas in addition to having passed at least one of the examinations instituted by law for teachers. In *Spain* teaching is unrestricted by regulations, except that the sanitary condition and morality of all schools are subject to State inspection. In *Switzerland* the regulations vary considerably in the different cantons. For elementary or primary education, which is universally under State direction, the general type of regulations is very like that of Prussia; but in most cantons education above the primary is almost without regulations, except in so far as concerns the education undertaken by the canton itself, and in that case the regulations, as a rule, are very similar to those for primary education. In the *United States* free trade in schools and teaching is without restrictions. In our larger colonies, *Australia*, *Canada*, *New Zealand*, the regulations, at any rate as far as primary instruction is concerned, tend more and more in general type to resemble those of Prussia. In Canada this is also true with regard to higher education, in so far as it is undertaken by the State. But this tendency has not up to the present in the case of any of these colonies become an accomplished fact. (*See* also DAY SCHOOLS.)

Prizes. *See* REWARDS.

Proctors.—Officers of the Universities of Oxford and Cambridge whose duty it is to attend to the discipline and behaviour of all persons *in statu pupillari*, and to search houses of ill-fame. In the evening they go their rounds, accompanied by their 'bull-dogs' (attendants who pursue

delinquents), and demand the name and college of any undergraduate or bachelor who is found without cap and gown, or whose conduct is unsatisfactory in any way. The offender is generally required to call upon the proctor the following morning, and is fined or otherwise punished according to his offence.

Procurators. *See* RECTOR.

Professors.—The title of 'professor' is given by courtesy to the regular lecturers at universities and colleges of recognised university rank. The professors at Oxford and Cambridge, of whom there are about forty at each university, are usually required to be in residence about six months of the academical year, and during that time to deliver a certain number of lectures open to all members of the university. They are expected to assist students attending their lectures, and each one to promote the study of his own subject. Many of the professorships at Oxford and Cambridge, however, are mere sinecures, the real work of teaching being left to the tutors (*q.v.*) or 'coaches.' In the Scottish and Irish universities, and in the London and provincial colleges (*q.v.*), the office of professor is of much greater importance.

Promotion. *See* CLASSIFICATION.

Pronunciation of Latin. *See* LATIN (PRONUNCIATION OF).

Prosody. *See* GRAMMAR.

Protoplasm. *See* BIOLOGY.

Provincial Colleges (Non-Theological).—The foundation of Owens College, Manchester, in 1851, led the way to a movement which, aided by the stimulus of University Extension (*q.v.*), has during the last fifteen years spread to most of the non-university towns of first-rate importance in England, Scotland, and Wales. The following is a list of such institutions, with date of foundation :—Owens College, Manchester, 1851; Durham University College of Physical Science, Newcastle-on-Tyne, 1871; University College of Wales, Aberystwith, 1872; Yorkshire College, Leeds, 1874; University College, Bristol, 1876; Firth College, Sheffield, 1879; Mason College, Birmingham, 1880; University College, Nottingham, 1881; University College, Liverpool, 1882; University College, Dundee, 1883; University College of South Wales and Monmouthshire, Cardiff, 1883; University College of North Wales, Bangor, 1884. The scheme of these colleges is to provide a higher education of university character for non-resident students of both sexes. Institutions of essentially the same character in the metropolis are: University College (founded in 1828 as the 'University of London'), and King's College. The recently founded Holloway College at Egham (opened 1886) is a college for resident women-students only. Several of the provincial colleges commenced their careers as colleges of physical science, e.g. the Yorkshire College, and the Mason College, Birmingham; but they now all (except Newcastle) include chairs of Greek, Latin, English, French, and German, and some of them chairs of History, Philosophy, and Fine Arts also. They may be said in general to be equipped with a faculty of Arts as well as a faculty of Science. All except the Mason College have a principal, who acts as chairman of the senate or academic board, composed of the professors, and represents the college generally. The government is vested in a council, and also a board of governors or trustees. The curriculum may be generally divided under two heads: (1) Regular or systematic training in the day classes, (2) popular instruction in the evening classes. Some of the colleges are taking steps to provide systematic evening instruction, and co-operating with school boards for the training of elementary teachers in preparation for the Government (teacher's) certificate. The regular day-students usually study for a degree at London University (women-students have also, since 1884, the privilege of entering for examination at Oxford without the condition of residence), or else are engaged in preparation for technical or industrial pursuits. The colleges are also largely attended by non-regular students (mostly women) who have no professional object in view, but welcome the opportunity of studying under the direction of a professor. The average proportion of men and women students may be roughly stated at two-thirds men and one-third women. The colleges have for the most part secured for their teaching staff men of the highest academical standing. This, the first experiment of importance in *mixed education* in this country, may be pronounced an unqualified success; the experience of the governors has been that here, as in America, no difficulties have arisen, and the presence of women in the classes

is universally pronounced to have a beneficial effect upon discipline and a refining influence upon the men. Many of these institutions show signs of a vigorous college life in unions and other college clubs, in all of which the women take an active part. Most of these colleges have been endowed by the private liberality either of a single person (e.g. Birmingham, Dundee), or of a number of persons acting together (e.g. Liverpool). Nottingham depends partly upon a benefaction, partly upon a rate levied by the Town Council. The Welsh colleges are in receipt of a Government grant (4,000*l.* per annum each). The question of the extension of Government support to all these institutions is one of vital interest to them; though in some cases handsomely endowed, they nearly all feel the pressure of pecuniary difficulties, or else are cramped in their development by lack of money. The master of Balliol has recently deserved well of the colleges by promoting the movement for inducing the Government to make a grant of the 50,000*l.* per annum which is necessary to place the higher education in our provincial towns upon a satisfactory footing. Another question of great importance for the future is that of the development of these institutions into provincial universities, i.e. bodies with the power of granting degrees. It is a question hedged round with many difficulties. On the one hand the present position of affairs is no doubt unsatisfactory: in the examinations of the University of London, for which students have to enter in order to get degrees, the professors of these colleges have no official voice or part. The result is a divorce between the teaching and examining functions. The work of the professors has to be entirely accommodated to the rigid demands of an external examination. This is stimulating to neither the teachers nor the taught. It is for the higher interests of the students that the professor should not degenerate into the mere 'coach.' And this is best secured by the Scotch or German system, in which the professors have a share in fixing the standard of examination and testing the candidates' work. It has certainly not been found that there is any tendency in new universities in England to allow the standard of examination to sink. The Victoria University (founded in 1880, and now including as constituent colleges Owens College, Manchester, University College, Liverpool, and the Yorkshire College) grants its degrees on terms certainly not less severe than any university in the country. Again, the establishment of provincial universities, in lending dignity and importance to the colleges, would do much to correct the provinciality of English provincial towns, and, like the nineteen universities of Germany, carry culture into all parts of the country. On the other hand, there are many serious difficulties in carrying out such a scheme. The work of a university involves great expenditure of time and money, and it would obviously be an extravagant arrangement if a separate set of examinations were conducted at each college. Possibly some way will be found of reconciling the real need for a closer relation between college and university than exists at present, with considerations of economy. The whole question is intimately connected with the future development of London University, which is now considering the possibility of giving the professors of the provincial colleges a voice in the direction of its examination system.

Psychology.—Mental science, or psychology, is the science which has for its special subject-matter the various activities which make up our mental life. As dealing with the phenomena of the inner world of mind or 'consciousness,' it stands in contrast to the physical sciences, which have to do with those of the external material world. At the same time, psychology holds a close connection with one branch of physical science, viz. Physiology (*q.v.*). We have to study mental phenomena not only in themselves as we observe them directly in our own minds, or indirectly by means of their outward manifestations in the minds of others, but also in connection with their physiological accompaniments and conditions, that is to say, the activities of the brain and nervous system as a whole. From this brief definition of the scope of the science it will be seen that it is the chief source of the principles or laws which make up the science or theory of education (*see* THEORY OF EDUCATION). Since the educator has to work on mind as his material, he requires to understand its inherent properties and the laws by which it is governed. The successful training and developing of the mind in any direction depends on our satisfying the necessary conditions of men-

tal growth. Thus the exercise and improvement of a child's memory can only take place by a fulfilment of the natural laws of memory (interest and association). Hence a knowledge of these laws is indispensable to one who would carry on the work of training minds intelligently, and with the assurance of following a right method. The science of psychology deals with mind in each of its three principal phases, Knowing or Intellect, Feeling or Emotion, and Activity or Will. And the special laws of each of these three great departments of mental life furnish the basis of a corresponding branch of education, viz. (1) Intellectual Education, (2) the culture of the feelings, or Æsthetic Education, and (3) the development of the will and character, or Moral Education. (*See* Sully, *Teacher's Handbook*, chap. i.; Herbart, *Briefe über die Anwendung der Psychologie auf die Pädagogik.*)

Public Schools. — The term public school is difficult to define. In England it has a meaning different from what it has in America. The American public school is a school supported by the community and open to all the world. When it is said that Public Schools are the backbone of the American system of education it is implied that there exist all over America a number of schools affording a liberal education either free or very inexpensive, accessible to all classes. An English public school implies something exclusive and privileged. A public school man is different from other men. The question as to whether a particular school is a public school or not depends, not upon its size or its efficiency, but upon its social rank. The American public schools are day schools; the English public school, in the strict sense, is essentially a boarding school. Our public schools are few in number, confined to particular districts, costly, and very diverse in individual character, yet it is said that they represent, more completely than any other English institution, the chief peculiarities of our national life. It is the public school that forms the typical Englishman; it is the ordinary English boy of the upper classes who gives his character to the public school. We have to inquire first, what are the English public schools; secondly, how did they come to be what they are; thirdly, what are their principal characteristics, and what relation do they bear to the educational system of England? When the English Government undertook some twenty-five years ago to inquire into the condition of our secondary education, nine schools were singled out from the rest as pre-eminent. These were Winchester, Eton, Westminster, Charterhouse, Harrow, Rugby, Merchant Taylors', St. Paul's, and Shrewsbury. Captain de Carteret Bisson, in *Our Schools and Colleges*, disputes the right of the last three, and reckons our public schools at six. These six between them do not educate much more than 4,000 boys, and yet they are so typical of all schools which may have a claim to the title of public, that we may conveniently confine our consideration to them, without disrespect to many new foundations of the highest distinction. Of these, Winchester dates from the fourteenth century, Eton from the fifteenth, Westminster, Harrow, and Rugby from the sixteenth—these three having all been founded within eleven years of each other—and Charterhouse from the seventeenth centuries.

Winchester, the oldest of the schools, has probably kept its character most unchanged. It has never been a fashionable or a court school. It has maintained, unimpaired, its close connection with New College at Oxford. Nothing can show more clearly the strength and unity of English traditions than the fact that five hundred years after the establishment of the two foundations of William of Wykeham, they should stand in the face of England holding the highest place, one as a college and the other as a school. Eton, the next on our list, is confessedly the first of public schools, but it was not always so.

During the first eighty years of the seventeenth century, Westminster undoubtedly held the position of pre-eminence. Dr. Busby (*q.v.*), who read the prayer for the king on the morning of Charles I.'s execution, and who refused to take off his cap in the presence of Charles II., was the first schoolmaster of his time in England. But Westminster was faithful to the Stuarts; Eton supported the cause of the Whigs. Its supremacy, beginning in the reign of William III., continued in that of Anne, reached its height under the Hanoverian kings. George III. took a strong personal interest in the school. Eton boys walked on the terrace of Wind-

sor Castle in court dress, and the king often stopped to ask their names and to speak to them. William IV., with boisterous good humour, continued the favour of his dynasty. He took the part of the boys in their rebellion against the masters, and he used to invite the boys to entertainments, at which the masters stood by and got nothing. During this period Eton became a political power in England. The upper school at Eton is decorated with the busts of statesmen who swayed the destinies of England, and who were the more closely connected together from having been educated at the same school. Chatham, North, Fox, Grenville, and Gray are among the ornaments of that historical room. Eton and Christ Church had the monopoly of education for public life, and the claim of the school to this distinction received its fullest recognition when Lord Wellesley, after a career spent in the most important offices of the State, desired that he might be laid to his last rest in the bosom of that mother from whom he had learnt everything which had made him famous, successful, and a patriot. Better known, perhaps, is the boast of his brother, the Duke of Wellington, that the battle of Waterloo was won in the playing-fields of Eton.

Charterhouse, established in London, has held since its foundation a position very similar to that of Winchester, not of great importance in politics or fashion, but highly influential and respected. These four schools were probably founded for the purposes which they have since succeeded in carrying out. Eton was always a school for the governing classes. Winchester and Charterhouse have received the uninterrupted support of the gentry and clergy of England. The history of Harrow and Rugby has been different. They have been lifted by circumstances into a position for which they were not originally intended. They were founded as local schools, one in the neighbourhood of London, the other in the heart of the Midlands, for the instruction first of the village lads, and then of such strangers as came to be taught. But they have reached, owing to special circumstances a position equal to any of their rivals. Harrow emerged from obscurity in the middle of the eighteenth century, owing, as it is said, her success to head masters who were sent to her from Eton Rugby is known throughout the world as the school of Arnold (*q.v.*), who was head master from 1827 to 1841. Even before his time it had attained a high rank amongst English schools, but he, followed by a line of distinguished successors, left it in scholarship and energy of thought at their head. Rugby and Balliol are to English education after the Reform Bill, what Eton and Christ Church were before it. This sketch will show how different the genesis of our public schools has been, and what various courses they have pursued to arrive at the same conclusion.

We will now briefly trace the history of the education they aim at. Their curriculum is essentially classical; indeed, a public school man means in common parlance one who has been educated mainly on Greek and Latin. The two oldest schools, Winchester and Eton, founded before the Reformation, naturally began with monkish learning. There was a great deal of grammar and a great deal of churchgoing. The pupils were children, and were treated as such. Westminster was founded after, and in consequence of, the Reformation, and the breach with the old learning necessitated new arrangements.

The author of the Protestant curriculum of public education was *John Sturm*, the friend of Roger Ascham, the head master of the great school of Strasburg during a large portion of the sixteenth century. A complete account of Sturm's methods and organisation is preserved, and we may be sure that its main outlines were adopted at Westminster and at Eton. Latin grammar and Latin style were made the principal subjects of education; the school was launched upon the full flood of humanism. The connection between a scholar in the narrow sense—that is, a man not of erudition, but of finished taste and polished style—and the gentleman was now fully established. Sturm was so despotic in the arrangements of his school, that he not only laid down what boys were to learn at each epoch of their career, but he forbade them to learn anything else. It was as great a fault to begin a subject prematurely as to neglect it in its due time. Many of Sturm's arrangements are familiar to public school men now living, but in the following century they underwent a further change. This was due to the Jesuits, who obtained their reputation partly by their devotion to the study of Greek, and partly by the pains they took to understand the

individual character of their pupils. The Jesuits have probably done more harm to sound education than any prominent body of men who ever undertook the task. They had two objects in view, to gain the favour of the rich and powerful, and to prevent the human mind from thinking. Humanistic education skilfully employed was an admirable instrument to this end. It flattered the pride of parents, whilst it cheated the ambition of scholars. The pre-eminence given in education to original *Latin verses* is typical of the whole system of the Jesuits. No exercise could be more pretty and attractive, or bear more clearly the outward semblance of culture and learning, yet no employment could more effectually delude the mind by an unsubstantial phantom of serious thought. The sturdy humanism of Sturm became corrupted by the graceful frivolity of the Jesuits, and in this condition public school education remained, until the efforts of a few obscure reformers, the genius and energy of Arnold, and the growth of the new spirit in England forced it into other channels.

Arnold is typical of the new public school; but we must distinguish between Arnold and the Arnoldian legend. Like other great reformers, his name has become a nucleus round which the reputations of all other reformers, good as well as bad, have coalesced. The most prominent fact about Arnold is that he was the first Englishman of quite first-rate ability who devoted himself to school education. The traditions of Sturm and the Jesuits shrivelled up before the manly touch of a teacher who was fit to be Prime Minister. After his career no one could despise the profession of a schoolmaster. What did Arnold actually effect? He taught boys to govern themselves. He substituted for a system in which the monitors were allowed any licence, on condition that they denied it to every one else, one in which the responsibility of the ruler was rated even more highly than the obligation of the ruled. He also taught boys to think for themselves, to pierce beyond the veil of words into the substance of things, to see realities, to touch and taste and handle the matter of which they had before only talked. Thus he produced a vigorous character and a manly mind. Rugby boys on passing to the university thought and acted for themselves. They might be pardoned if, in the first flush of enthusiasm, they acted priggishly and thought wildly. But Arnold's teaching contained within it germs of much which he had never contemplated, and of which he would have disapproved. It contained the germs of the modern civilised life in schools of which Rugby knew nothing in 1840. Far indeed is the cry from that dim and crowded dining-room, where boys sitting at a bare table wiped their knives on the iron band which surrounded it, and ate their meat and pudding off the same plate, to the luxurious arrangements of a modern preparatory school. It contained the germ of modern-side education. Arnold did not know that he was passing from Melanchthon to Comenius, and that the study of things once set rolling would soon displace the study of words. It contained the germs of a new confidence and friendship between boy and master, quite as different from the sly sentimentality of the Jesuits as it was from the pompous neglect of the old-fashioned courtly don. It contained, alas! in germ the subjection of the master to the boy in standard, tastes, and habits, which threatens to be the ruin of our public schools. It crystallised also the idea which otherwise might have disappeared, that a head master must be of necessity a clergyman, and that no school could be properly conducted unless its chief sums up in the pulpit every Sunday afternoon what are supposed to be the spiritual results of the week's emotions. It stamped also with permanence, by a natural misunderstanding, that conviction of a head master's autocracy which prevents the formation in England of a profession of education. The history of English public schools since Arnold is merely the carrying out, under varying circumstances, of the teaching of his example, and the development, sometimes to disastrous ends, of abuses to which that example may seem to lend currency.

A few words only are needed in conclusion as to the present and future of our public boarding schools. Nothing has altered their character more than their growth in numbers, which has been the result of popularity. In Arnold's time, no public school except Eton exceeded 300 boys. Arnold and his contemporary head masters might boast with truth that they knew every boy in their school by sight, his habits, his capacity, his friends,

A school thus governed by one man, and penetrated by his influence, differed, not only in degree but in kind, from a school which has of necessity become a confederation. In a public school of Arnold's date, games were still amusements. Formerly neglected and ignored by pedagogues, they became the nurse of every manly virtue when a more sympathetic eye was turned upon them. *Tom Brown's School-days* represents the heroism of the forties; the high-water mark when boyish enterprise and independence reached their height under the influence of manly recognition. During the last quarter of a century, games have become a serious business, instead of the wholesome distraction of public school life. They are organised as elaborately as the work. Masters are appointed to teach them like any other branch of study; they form the basis of admiration and imitation between boy and boy, and the foundation of respect and obedience between boy and master. It is difficult to keep large numbers of boys, with only five years' difference in their ages, quiet and wholesome without a large development of games. They have been admitted to their full share in the school curriculum. A public boarding school is no longer a place where amidst much liberty and idleness there reigns a high respect for character and intellect, and where the ablest boys are left ample room to fashion each other and themselves. It is a place where the whole life is tabulated and arranged, where leisure, meditation, and individual study are discouraged, and where boys are driven in a ceaseless round from school to play-room, from play-room to school, regarding each as of equal importance, and bringing into the most delicate operations of intellectual growth the spirit of coarse competition which dominates in athletics. It is difficult to say what changes public boarding schools are destined to undergo, or whether, in an age in which education is so much extended, a system so expensive and so exclusive can continue to flourish. The last few years have witnessed the growth of large public day schools, and any development of national education would be certain to increase their number. Although the Arnoldian system is little applicable to them on its best side, yet they are of necessity free from most of the abuses to which that system has given rise. An idea may grow up that the home is, after all, the best place for children, and that children are the best safeguard of a pure and happy home. Should English society in its new development prefer a kind of education which is the normal type of all countries but our own, and which improved communication makes it easier to adopt, we shall still have public schools of which we may be proud, they will continue to represent our best national qualities, but they will be very different from the public boarding schools of the past.

Public Schools Missions.—Several of the public schools now support one or more clergy, laymen, and organisations at work in the poorest part of London and elsewhere. Uppingham was one of the first to promote the mission movement. Various books (e.g. *The Bitter Cry of Outcast London*) and illustrated papers had drawn attention to the state of the outcasts. The missions are somewhat similar to those of the universities. They are not all in London. Thus, Winchester has one at Portsmouth, and Rugby has a mission (the Rugby Fox Memorial) to Indian boys at Masulipatam, and Haileybury a lecturer at Agra. The following public schools had missions in 1888: (1) Eton (Hackney Wick, E.); (2) Harrow (Latimer Road, W.); (3) Charterhouse (Southwark, S.E.); (4) Clifton (Bristol); (5) Felstead (Bromley, E.); (6) Haileybury (Agra, India); (7) Marlborough (Tottenham, S.E.); (8) Magdalen College School, Oxford (Umba, E. Africa, and Fulham); (9) Rossall (Newton Heath, Manchester); (10) Tonbridge (King's Cross, N.E.); (11) Uppingham (Poplar, E.); (12) Wellington, Berks (Walworth, S.E.); (13) Winchester (Landport, Portsmouth); (14) Radley; (15) Cheltenham; (16) Bradfield; (17) Aldenham; (18) Malvern. Several masters have testified that the tone of their schools has improved since their boys thus learned to sympathise intelligently with the struggles of the poor. Details will be found in the *Church of England Year-Book* (S.P.C.K., 2*s.* 6*d.*). (See also articles UNIVERSITY SETTLEMENTS, PAUPER EDUCATION, RAGGED SCHOOLS, &c.)

Punctuation.—It is important to arrange our words carefully if we desire our meaning to be clear. But sometimes the words may be excellently arranged, and yet it may be difficult to decide whether a word refers to the one before it or the

one after it, or whether certain words are to be taken as forming a phrase or a sentence by themselves apart from the rest. We indicate our meaning in such cases when speaking by making a pause between the words which we do not wish our hearers to take together; or we pause before and after a set of words which we do wish to be taken together. In writing we represent these pauses by marks, or *stops*, placing them between the words we wish to separate, and before and after the words we wish to group together. To place these stops amongst the words of a sentence is to *punctuate* it. The stops most frequently used are the *comma* (,) and the *full-stop* (.); and besides these there are the *semicolon* (;), the *colon* (:), and the *dash* (—). The *full-stop* indicates that we have come to the end of our statement so far, and that if any other statement follows, it must be taken as a new and somewhat independent one. The *comma* generally indicates that, for some reason of emphasis or clearness, a word is separated from that to which it more particularly refers. The intruding word or phrase will, by what we have just said, have a comma both before it and after it, unless it directly describes the word on which it intrudes. Compare, for instance: 'The jury, having retired for an hour, brought in a verdict of guilty;' and 'A king depending on the support of his subjects, cannot rashly declare war.' The object in using commas being to indicate that the words cut off by them are to be taken together, it follows that when the subject of a sentence is made very long by reason of its phrases we should place a comma after it, especially if it contains some noun which might be mistaken for the subject—e.g. 'The danger of leaving his rear unprotected by even a handful of cavalry, was beginning to show itself clearly.' The first of a pair of commas is not expressed when it comes at the beginning of a sentence, and the second of the pair is always merged in any weightier stop with which it coincides, and hence the bracketing or parenthetic nature of commas—which is the more frequent—is often missed. Of course, if a word or phrase closely referring to some other word or phrase is placed (for convenience or emphasis) out of its usual position, we should by our general rule mark it off from the rest of the statement by commas. This will most frequently be the case with adverbial phrases or clauses placed at the beginning of a statement. A string of words all on the same footing in a sentence, whether single or in pairs, are divided up by single commas when there are no conjunctions employed to link them together; *e.g.* 'We have lost in him a good, wise, true and loving friend. He was indeed kind and firm, gentle and strong, simple and wise.' If a word or phrase of mere explanation, an interjection, or the name of the person spoken to, be inserted in a sentence, it will of course be marked off by commas. These are the *main* uses of commas. When a statement is long, and contains many clauses placed together to throw light on one another, we shall usually find that we want a stop more marked than a comma, and yet not so marked as a full-stop. The stop employed in such cases is the *semicolon*; or, if in addition a slightly weightier mark be required, a *colon*. The *dash* is used to mark that the construction of a sentence is suddenly broken; or in a long paragraph to mark the return to the main thread of the statement; or to draw together and sum up all that precedes.

The following are good examples of the use of *semicolons* and *colons*: 'Sloth makes all things difficult, but industry all things easy; and he that riseth late must trot all day, and shall scarce overtake his business at night.' 'If this life is unhappy, it is a burden to us which it is difficult to bear; if it is in every respect happy, it is dreadful to be deprived of it: so that, in either case, the result is the same; for we must exist in anxiety and apprehension.' As a rule, however, *colons* are nowadays generally replaced by *full-stops*.

As examples of the use of the *dash* the following will be found suggestive: 'Oh that you had only—but why cry over spilt milk?' 'The flaws and flecks in his character—for even the best of us have flaws and flecks—I do not care to discuss.' 'He wept and moaned; he looked dolorous, and shunned his friends; he put up the shutters, and dressed himself in black—this was what he called "showing due respect."'

In addition to the above, there are certain other marks used—not exactly *stops*, but somewhat of their nature—which correspond rather to the *tone* of a speaker than to his pauses. They are the *note of*

interrogation (?), which marks a question; the *note of exclamation* (!), which marks surprise or excitement; *inverted commas* (" "), which tell us that the words between them are borrowed from somewhere else; single *inverted commas* (' ') sometimes indicate that the sense, not the wording, is quoted. Lastly, there is the *parenthesis* ( ), which is used to mark off *entirely* from the rest of the sentence some explanatory word or phrase, the insertion of which clearness seems to demand, or which some association or feeling prompts. But the *parenthesis* is often replaced by a couple of *dashes*, as will be seen above in this very paragraph.

Punishment is commonly defined as pain or suffering inflicted by one in authority, and as the consequence of some offence or violation of command. The power to punish is essentially involved in what we call authority. The control of the individual by the community is carried out by a system of commands backed by punishment; whether legal penalties enforced by the magistrate, or social penalties, e.g. loss of reputation imposed by society for extra-legal offences. The question of the true grounds of punishment has been much discussed, some viewing it as retributive, or a self-protective reaction of the community against an injury; others laying emphasis on its deterrent function in relation to other possible offenders; others, again, insisting on its ameliorative or reformatory purpose in relation to the individual that is punished. What has been called pædagogic punishment, that is, as inflicted by the parent or other governor of the child, is mainly dealt with by educational writers on its reformatory side, that is, as a means of correcting and improving a faulty will in the individual punished. Difficult problems surround the subject of punishment, such as the questions: What cases are meet for punishment, what are the most suitable kinds of punishment, and how can the degree of punishment be best proportioned to the fault? These have been dealt with in a luminous way by Bentham; and though his principles relate primarily to punishment by the State, they will be found to have an important bearing on the correction of the young.[1] The tendency of recent writers, due in part to the growth of humanitarianism, in part to the influence of authorities like Locke and Rousseau, has been to attribute less value to punishment as a means of moral education. As an artificial stimulus, needed only because the proper motives which impel to right conduct are weak, punishment is to be used sparingly, and dispensed with as soon as possible. The child is to be led to feel the natural results of wrong actions, e.g. the displeasure, or loss of the confidence, of its parent or teacher, to be a sufficient penalty. (*See* art. CONSEQUENCES, DISCIPLINE OF.) It is seen, too, in connection with school discipline, that while the power to punish must exist and be recognised, its frequent exercise is apt to be frustrative of the teacher's object. An affectionate concern for the learner's good, and the endeavour to attract, rather than repel, him to schoolwork, and to help him over his difficulties, which springs out of such a concern, will very much reduce in number, if not entirely eliminate, the occasions for punishment. Cf. articles CORPORAL PUNISHMENT and DISCIPLINE. (*See* Locke, *Thoughts*, § 43 and following; Bain, *Education as a Science*, p. 114 and following; Thring, *Theory and Practice of Teaching*, chap. xiii.; Beneke, *Erziehungs- und Unterrichtslehre*, § 77; Waitz, *Allgem. Pädagogik*, § 13, and article 'Strafe' in Schmid's *Encyclopädie*.)

Pupil-teachers.—The Minutes of the Committee of Council which, in 1846, under the inspiration of Sir James Kay Shuttleworth, then chief secretary, instituted the 'certificate of merit' for elementary teachers, also inaugurated the pupil-teacher system (imitated from Holland), as a means of ensuring a succession of such teachers, and of supplying an adequate teaching staff for the rapidly increasing elementary schools. The latter was, on the surface, the most pressing need. Previous to this an elementary school was staffed on the *monitorial* system, originated by Lancaster and Bell, by which some of the older and more proficient scholars of the school were the (sole) assistants of the head teacher. These monitors, as they were called, at best were children of only thirteen or fourteen years of age, and constituted an ever-shifting body, as each, after a year or two's work in that capacity, was removed by his parents and sent to work. The real teaching power (beyond mere rote-work) of such a staff as this was obviously of the poorest kind. If, however,

[1] For a *résumé* of Bentham's principles, see Bain, *Education as a Science*, p. 106, note.

these children could by adequate pecuniary inducements be attracted from proceeding to other spheres of work, in order to take up the career of a teacher as a means of livelihood, the school-assistant staff would be composed of ex-scholars of at least thirteen years of age, instead of scholars of at most fourteen years of age, and thus one weakness, that of the extreme youthfulness of the staff, would be partially remedied. The enforcement of a term of apprenticeship would remedy the other weakness. It was to replace the monitorial system by some system on these lines that the Minutes of 1846 established 'pupil-teachers.' By these Minutes the Committee of Council offered to every pupil-teacher whose parents or guardians consented to apprentice him (or her) for a term of years (usually five), commencing at thirteen years of age, an annual stipend of 10*l.* for the first year of apprenticeship, rising by annual increments to 20*l.* for the last year. The pupil-teacher was required to be of good character, and to come from a respectable home. He was further required to pass an examination before her Majesty's inspector at admission, and at the end of each year of apprenticeship. He was to be a teacher, assisting the head teacher in the instruction of the scholars during school hours, and he was to be a pupil, receiving separate instruction from him out of school hours for one hour and a half daily. As an inducement to the head teacher to secure good candidates for pupil-teachership, and to instruct his pupil-teachers efficiently, the Committee of Council offered him an annual gratuity of 3*l.* to 4*l.* for each pupil-teacher who passed with credit the examination at the end of each year of apprenticeship.

In its broad features the pupil-teacher system remains to this day in the same form as it was established by the Minutes of 1846. The grants from Government on behalf of pupil-teachers are, however, now (since Revised Code, 1862) paid to the managers of the school, who are free to make their own terms with this, as well as with every other part of the school staff. At first no limit was placed upon the number of pupil-teachers which a head teacher could employ, nor upon the number of scholars who might be placed under his charge. But it soon became obvious that there were limits to the proportion which the amount of unskilled labour of the pupil-teachers in a school should under any circumstances bear to that of the skilled labour of the adult teachers, and from time to time (since 1862) the Code regulations have limited the number of pupil-teachers who may be employed for each head teacher or adult (certificated) assistant. This now stands at three for the principal teacher, and one for each certificated assistant. Moreover, the age at which apprenticeship can be commenced has been raised from thirteen to fourteen years of age, and the number of scholars which (in estimating what is the minimum school staff required) is considered sufficient for a pupil-teacher is now forty in average attendance, and for a candidate pupil-teacher, twenty.

The standard of attainments required to be shown by candidates for pupil-teachership, and by pupil-teachers at the end of each year of apprenticeship, has been gradually raised by successive codes, and now stands at a pass in Standard VI. or VII. in the three elementary subjects, and two of the class subjects (*see* art. CODE), of which English must be one. The requirements for each year of apprenticeship are laid down in Schedule V. of the Code, and embrace English grammar and composition, arithmetic and mathematics (algebra and quadratics, Euclid, bk. i., ii.), geography, history, teaching, all of which are obligatory subjects, and ancient and modern languages, science, drawing, and music, which are optional. The 'Queen's scholarship' examination (*see* TRAINING OF TEACHERS) is accepted as equivalent to the examination for the end of the last year of apprenticeship. On passing the examination the pupil-teacher acquires the right to obtain two years' training in a training college, at a cost to the country of 75 per cent. of the expenditure on his behalf (*see* TRAINING OF TEACHERS).

The efficient instruction of the pupil-teachers to meet the requirements of these annual examinations has long been felt to be one of the greatest difficulties inherent in the system. The physical strain on these young persons, who, either before or after a hard day's work in school, have to prepare and say their own lessons, has been made the subject of repeated animadversions, and, in the face of the obvious overpressure to which they have been subjected, the Department has considerably reduced their hours of labour in school, which now stand at not less than three, or

more than six, upon any one day, nor more than twenty-five hours in any one week. This has the effect of releasing the pupil-teachers from school work for one half day in each week, besides Saturday. Their own instruction must occupy at least five hours per week, of which not more than three shall be part of one day.

But under the most favourable circumstances, the process of instructing pupil-teachers must involve a great waste of power, which (except in purely rural districts) might be avoided. Under the regulations detailed above, a head teacher will have his three or four pupil-teachers, most probably in different years of their apprenticeship, and therefore, though perhaps studying the same subject, yet studying different stages of it. In another school building close at hand, or perhaps in an adjoining department of the same building, another head teacher is doing likewise. An obvious remedy for this state of things suggests itself as applicable in towns, and that is the grouping of all the pupil-teachers from all the schools within a given radius into a central building, where they could be organised in classes according to subject and year of apprenticeship—in fact, creating a pupil-teacher college, to be in session for from five to ten hours each week. The proposal thus to establish a central system of instruction of pupil-teachers was made by the London and other School Boards, and met with acceptance from the Committee of Council, who modified their regulations so as to admit of a pupil-teacher receiving instruction from any certificated teacher or other qualified teacher approved by them. The schemes of central classes which have been carried out by the School Boards of London, Liverpool, Birmingham, and other towns have been shown in practice to possess other advantages besides the saving of power and the proper grading of the pupil-teachers. The appointment of one organising head, or director, of these classes, with a staff of teachers (selected from among certificated teachers of the School Board) who are specially qualified to teach each subject, gives a unity of aim to the work, and ensures that that work shall be of the best, and be equally good throughout. By class teaching and class examinations the pupil-teachers can measure their relative capacity and knowledge, and thus a stimulus and a zest are supplied which are unknown under the individual system. The head teacher of the school is not understood to be released from all responsibility towards his pupil-teachers, but it is still his duty to instruct them in the art of teaching by model and criticism lessons, and to exercise tutorial supervision over the home lessons prepared for the central classes. It has been feared by some that the intimate and quasi-paternal relationship between head teacher and pupil-teacher which is fostered by the individual system, and which has great value in presence of the youthfulness of the pupil-teacher, would be weakened by the central system, and there is some ground for such fears. But the answer is that this tie has been already considerably weakened by the mode of selecting candidates for pupil-teachership, which is necessitated by the modern conditions under which School Boards supply their schools with adequate staff. Candidates are no longer necessarily or actually taken from the more promising scholars of the school, nor selected by the head teacher. A school in a poor neighbourhood, for instance, yields no eligible candidates at all. Then, again, it has been felt undesirable to recruit the ranks of the pupil-teachers entirely, or even to large extent, from the class that usually attend elementary schools, but rather to seek for recruits from among the scholars of secondary schools.

The difficulties surrounding the whole working of the pupil-teacher system, the meagre intellectual results accruing from instruction given by such young and unskilled teachers, the disparity between the number of pupil-teachers (28,000) induced to adopt the profession of teaching, to the number with any real aptitude for teaching, has led many educationists to advocate the entire abolition of the system.

Purity in Schools.—The question to be treated in this article is a difficult and delicate one, but it is one of great importance in connection with education. The subject of purity is one that needs constant watchfulness on the part of those entrusted with the care of the young, and it is a cause of thankfulness that they have become more alive to the existence of dangers connected with it, and the necessity of guarding against them. They have to steer between two extremes: the carelessness which shuts its eyes to evils and makes no attempt to counteract them, and the overfussiness which never dis-

misses them from its thoughts, but suspects them at all times and everywhere. The object of this article is rather to direct the attention to possible dangers, and mention safeguards that have been tried, than to pronounce any positive opinions.

The evil of impurity exists in different schools in different forms, which cannot be spoken of in an article intended for general reading. The following dangers, however, are such as may be mentioned, and are sometimes overlooked: the mixing of the young of widely different ages in the same school; the use of unexpurgated editions of classical authors; the introduction into a school of the advertisements of quack-doctors, or of bad photographs under apparently innocent titles. Precautions may be taken by the proper arrangements of closets, lavatories, baths, above all of dormitories. It is a much disputed question whether cubicles or open dormitories are the greatest protection against evil. It has been suggested as a safeguard against the introduction of bad printed matter into schools that *the outsides* of the contents of the letter-bag should always pass under the eye of the master, so that if any suspicious document appears he may require the pupil to open it in his presence; in this way some very dangerous attempts against the virtue of boys in great public schools have been discovered. Expurgated editions of nearly all the principal classical authors are procurable, and are generally used in most of the higher schools. It is a vexed question to what extent athletics are a safeguard and help against the vice of impurity.

But, after all, if a low moral tone prevails in a school the most elaborate precautions will be evaded; the true safeguard is the maintenance of a high moral standard on the subject of purity. Various means towards this end have been suggested:—1. A warning addressed by a parent to his child before he enters school, and from time to time repeated. 2. A similar warning from a master when the boy first comes. 3. Occasional addresses from a master to his whole school, or to certain sections of it, distributed according to age; this method, however, is open to the objection that to boys of impure mind it gives occasion for scoffing comments afterwards. 4. In Church schools, warnings at the season of Confirmation, which may often serve to reclaim a boy, but may come too late to preserve him from contamination; in some cases a card containing a special promise and prayer against this particular sin have been given at this season.

A committee of head and assistant masters from schools which are represented at the Head Masters' Conference, or which prepare for those schools, has been formed under the auspices of the Church of England Purity Society. The committee in 1888 consisted of the following head masters and others:—Rev. G. C. Bell (Marlborough); Mr. H. M. Draper (Lockers Park School, Hemel Hempstead); Rev. J. T. H. Du Boulay (Assistant Master at Winchester College); Rev. J. H. Edgar (Temple Grove School, East Sheen); Hon. and Rev. E. Lyttelton (Assistant Master at Eton); Rev. J. Robertson (Haileybury); Rev. Dr. Stokoe (King's College School, London); Rev. R. S. Tabor (Cheam); Rev. J. E. C. Welldon (Harrow); Rev. E. C. Wickham (Wellington) (Chairman); Rev. Dr. Wood (Woodbridge); Rev. Dr. Blore (late of the King's School, Canterbury) (Secretary). They have issued a printed paper which a master may, if he thinks fit, place in the hands of a parent before his boy is received into the school, calling his attention to this particular danger, and the advisability of warning his boy against it. They have also recommended books giving useful hints on the subject of purity, *for the use of teachers or parents*—viz. *Schoolboy Morality: an Address to Mothers*, by E. C. P.; Letter from a Head-Master, *Purity the true Guard of Manhood; Your Innings*, by Rev. George Everard (price 1*s.*); *Moral Education of the Young*, by Dr. Elizabeth Blackwell; Paper read at the Church Congress, 1884, by (the late) Rev E. Thring; *Morality in Public Schools*, by the Very Rev. Dr. Butler, late Head-Master of Harrow; *Letter to a Lad*, Anon. Copies of these and a classified list of other books may be obtained from the C.E.P.S., 111 Palace Chambers, Westminster, S.W. The minimum subscription to the Central Society is 5*s.* Teachers should notice the small periodical *The Vanguard*, 1*s.* 6*d.* a year post free. Handy papers on the subject have been published also by the White Cross Society (a list may be obtained from Hatchards', 187 Piccadilly, or from the secretary, Mr. J.

S. S. Vidal, Museum Close, Oxford); and by the Social Purity Alliance (secretary, Rev. R. A. Bullen, 33 Vincent Square, S.W.). This Alliance admits ladies as members and on the committee. Minimum subscription 1*s*. A further attempt is being made by the C.E.P.S. to form a committee representing classes of schools other than those mentioned.

In the diocese of Chichester the diocesan branch of the C.E.P.S. have adopted the plan of calling together from time to time meetings of masters of all classes of schools for papers and discussions on purity. In general it may be said that in many directions attention is being called to this question, and encouraging efforts are being made to promote purity in schools, and to combat and repress the opposite vice. In connection with helping old pupils, whether boys or girls, especially those leaving villages for employment elsewhere, teachers will find it useful to communicate with the various centralising institutions, such as the Young Men's Friendly Society, Girls' F. S., Y. M. Christian Association (Exeter Hall, Strand, W.C.), Central Vigilance Association, and the National Vigilance Association (267 Strand, W.C.).

Q

Quadrivium. *See* MIDDLE AGES (SCHOOLS OF).

Queen's Colleges and Royal University, Ireland. *See* UNIVERSITIES.

Queen's Scholarships. *See* CERTIFICATED TEACHERS.

Question and Answer.—As has already been pointed out in the article on 'Oral Instruction' one of the teacher's primary objects in putting questions to children is to enable him to ascertain what they know and the degree of development which their various intellectual faculties have reached. Until the teacher has learnt this he cannot properly proceed either to instruct or to train. At the same time and by the same means he will ascertain, and make evident to the child himself, what is almost as important, viz. what the child does not know, and what are his misconceptions and difficulties. This was the general character of Socrates' questioning. When these things have been done, the teacher has next to excite the child's curiosity and interest, and to set his faculties to work; in other words, to induce him to make use of what he knows, to take an active part in the lesson, and to maintain that activity. Here the questions should be stimulative, and suggestive of lines and modes of thought and inquiry. They should also serve to keep the teacher in touch with the pupil, and make evident whether the latter is following the lesson, and if so, how far. There are dangers to be avoided in both these kinds of questioning. By the former (the Socratic) the pupil will learn that many things are not so simple as he had thought, and that much which he thought he knew he does not know. There is great danger that he may grow bewildered and disheartened in consequence. Care, therefore, must be taken to avoid this. It will be enough if he learns somewhat of the value of scrupulous accuracy, and of the rashness of generalising without sufficient facts, and dogmatising without sufficient consideration. In the second case there is danger of creating too great surprise and wonderment, of raising undue expectations, of running off on side issues, of over-stimulation and over-suggestion. We do not want the child to depend too much on external stimulus, nor should we interfere too far with its self-activity. Care again is manifestly needed here. It will be readily seen that questions should be simply worded, perfectly clear and unambiguous in meaning, and as briefly expressed as possible, so that they may be quickly grasped and easily borne in mind. They should never suggest their own answers. It is rarely wise to ask questions which can be answered by a mere 'yes' or 'no;' and to make an assertion and leave the pupil to fill up the last word, is a bad plan; nor should the questions be such, as a rule, as can be answered by a broken, incomplete sentence, or by a single disconnected word. Answers of this kind should not be accepted. Questions should not be too wide and comprehensive, as 'What happened in the reign of Elizabeth?' but definite and directed to a point; logically and naturally connected, both with the answer just given and with

previous questions and those which are to follow; connected also with the general aim of the lesson. In general the question 'Why?' should be used with caution. It is liable in many cases to lead to answers very incomplete, or to mere guessing; in fact, it frequently asks for more than a teacher can reasonably expect to have answered. Questions should be well distributed throughout a class, and collective answering allowed as sparingly as possible. As a rule, when the questions refer to past work and to the general theme of the lesson they may be answered collectively; but they should not be so answered when they are used to elucidate a particular point or to work out a particular argument. The teacher will find it a great help when framing his questions to imagine the answers which may be fairly given to them to be written out consecutively. When so written they should form an intelligible, logically connected outline of the lesson. If a question fails to get an answer, put the inquiry in another way, or break up the question into a string of simpler questions leading up to the original inquiry. If the class remains obstinately dumb, or the answers are random and foolish, then the discipline is wrong somewhere, or the class has not been interested, or the matter in hand is entirely beyond them. Often, however, a pupil's bad answer is a teacher's opportunity—not for 'scoring off' the delinquent, which is usually unwise—but for proving his point by logically working out the wrong answer and showing its untenableness. It is of course unnecessary to state that a *pupil's* questions, as long as they are fairly to the point and fairly reasonable, should receive due attention; indeed, if no questions are asked by the pupils we may be sure that they are not interested. But if the questions are premature, or random, or foolish, it is better to leave the answering of them to the end of the lesson, by which time they will have answered themselves, or have been seen to be useless, or may be dealt with as disorderly. From what has been said it will be manifest that *books* written in the form of question and answer are useless.

Questionists. *See* TRIPOS.

Quintilian. *See* ROMAN EDUCATION.

R

Ragged Schools, which in London owe their existence chiefly to the exertions of the seventh Earl of Shaftesbury, when Lord Ashley (see Biographies, by E. Hodder, 1886, Cassell & Co., 36*s.*, or 7*s.* 6*d.*; G. H. Pike, 1884, Partridge & Co., 1*s.*; and John Kirton, 1886, Ward & Lock, 2*s.* 6*d.*), have for their object the education and benefit of the most indigent poor of all ages. The Ragged School Union, with which the London schools generally are affiliated, has its headquarters at Exeter Hall (Strand, W.C., John Kirk, sec.). From the beginning, in 1844, till his death, Lord Shaftesbury was president. The objects of the Union are (1) to assist individual schools by money grants; (2) to collect and disseminate information such as teachers can utilise, and to enlist the co-operation of the public; and (3) by means of special visitations, &c., to take notice of progress made, and to suggest improvements in the management of the schools and their mission branches. Religious teaching has to be given in all the schools assisted, the Authorised Version of the Scriptures used, and the instruction must be free.

Ragged schools are generally supposed to have had their origin in Scotland; but, although not at first known as such, institutions exactly corresponding to those subsequently recognised as ragged schools were founded in London by the quondam soldier, Thomas Cranfield (see Life, *The Useful Christian*, R. T. S., 1*s.* 6*d.*), and in Germany by John Falk, of whom some account was published at Weimar in 1868, while references to the man and his work occur in the Life of the German publisher, Frederick Perthes. These men were merely pioneers, however. Even the work commenced by Robert Raikes (see Biographies, by Gregory, Hodder & Stoughton, 1877, 2*s.* 6*d.*; Paxton Hood, *The Day, the Book, and the Teacher*, Sunday School Union, 1880, 2*s.* 6*d.*) at Gloucester was very similar in character; while the picture which Cowper gives of street-children at Olney shows that such classes would have been essentially what has come to be known as of the 'ragged' type.

John Falk, 1768–1826, who has been called the original 'ragged-school master,' was both an exemplar in his calling and an enthusiast. At the close of the great European war, the naturally great numbers of soldiers' orphans in a shocking condition attracted Falk's attention. Instead of allowing them to lapse into crime and to fill the prisons, Falk attempted to give them a better kind of discipline, and with such success that he could soon say: 'The children of robbers and murderers sing psalms and pray; boys are making locks out of the insulting iron which was destined for their hands and feet; and are building houses which they formerly delighted to break open. . . . Where chains and stocks, the lash and the prison, were powerless, *Love* comes off victorious.' This famous saying is the key to the ragged school method.

Some years before, Cranfield had commenced work in the slums of South London, and the Camberwell Ragged School Mission, Toulon Street, S.E., is a continuation of his labours. Later on came the operations at Aberdeen and Edinburgh, which interested the Queen and Prince Consort. Thomas Guthrie's *Plea for Ragged Schools* drew forth an encomium from Lord Jeffrey, and appeared in 1847. This was followed ten years later by *The City: its Sins and its Sorrows*; and in 1860 by *Seedtime and Harvest*. A ragged school was opened in Rome soon after the political changes of 1870.

The pioneers of forty years ago devoted their energies chiefly to the establishment of day-schools; but at present, consequent upon the development of the work of School Boards, set in motion by the Act of 1870, they are becoming more and more a necessary supplementary agency to the work undertaken by the State. Increased attention is not only being given to religious teaching on the Sabbath, but, by means of a number of parental agencies which are maintained throughout the week, endeavours are made to educate the whole moral nature of the children. It is also sought to maintain a hold on elder scholars who are above school age, in addition to a large amount of adult work. There were in 1888 regularly gathered week by week at least 48,000 children in the 238 ragged Sunday schools of London; and this fact alone shows why they can never altogether be superseded by Board schools. The Universities Settlements (*q.v.*) are extensions of the idea (*see* articles PAUPER EDUCATION, WAIFS, &c.). Typical schools, in addition to those already mentioned, would be found at Sermon Lane, Liverpool Road, Islington; Ogle Mews, Foley Street, Portland Place, W.; George Yard, High Street, Whitechapel; King Edward Street, Spitalfields; Christ Church, Watney Street, E.; St. Thomas's, Waterloo Road; Field Lane, Vine Street, Clerkenwell, &c., &c.

The modern ragged school has developed many varied agencies. Thus, the first Shoeblack Brigade was founded by Mr. J. Macgregor ('Rob Roy'), in 1851; and in London alone in 1888 there were between 300 and 400 lads who found employment (Central Red Brigade, Saffron Hill, Holborn), whose earnings were about 11,000*l.* a year. Mr. W. J. Ossman's work at Costers' Hall, High Street, Hoxton, which has vastly helped the street-vendors; Mr. George Hatton's striking service in the reclamation of thieves, Brooke Street, Holborn, and branches in St. Giles's; Mr. Charrington's Hall (Mile End Road), for seating 6,000 persons, with coffee-palace, book-saloon, and recreation rooms attached; and Dr. Barnardo's extensive operations in the rescue of destitute children (Stepney Causeway and branches), not to mention many others (*see* article WAIFS AND STRAYS), are all developments of the many-sided ragged-school enterprise. Indeed, the branches which the original tree has put forth are very numerous, e.g. industrial classes, evening recreation rooms, school exhibitions, summer holidays at suitably appointed country homes, clubs for the encouragement of thrift, libraries, penny banks, breakfasts and dinners for children in winter, Sunday morning breakfasts for the destitute, &c. The history of any school in London can be learned at Exeter Hall, Strand, where also a complete list of the schools can be had. Large towns, such as Glasgow, Liverpool, Manchester, &c., have unions of their own, and there are few of the larger provincial towns without one or more ragged schools.

Ragged schools are still being rapidly adapted to the altered circumstances of the times. 'The Shaftesbury Fund' is specially intended to promote the rebuilding or improvement of unsuitable school-

houses. The buildings were exempted from rates about twenty years ago. The general results of ragged-school operations were summed up by the late Lord Shaftesbury when he said that the Union had up to that time been instrumental in saving 300,000 children from lapsing into courses of crime.

While it will be impossible to give a complete bibliography of the subject, mention may be made of the annual volumes of the *Ragged School Union Magazine* (Kent & Co., 2*s.* 6*d.*, 1849–75), in which articles on the social, political, and religious aspect of ragged-school teaching may be found. *The Quarterly Record* (12 vols., 1876–87) is a continuation of the above; and a new series, *In His Name*, was commenced in 1888 (J. F. Shaw & Co., one penny monthly). *See* also Report of Conference in 1883; also Report of the proceedings on Lord Shaftesbury's 80th birthday (R. S. U., Strand, W.C.). Pike's *Pity for the Perishing* (Clarke & Co., 1885, 3*s.* 6*d.*) describes the work at several centres. *Saving to the Uttermost* (Hodder & Stoughton, 1885, 2*s.* 6*d.*) deals with work in St. Giles's and among thieves. *See* also *The Harvests of the City*, by Pearl Fisher, 3*s.* 6*d.* (J. F. Shaw & Co.); *Recollections of John Pounds* (Williams & Norgate, 1884, 5*s.*).

Raikes, Robert (1736 – 1811), the founder of Sunday Schools (*q.v.*), was a native of Bristol, and proprietor of the *Gloucester Journal*. Actuated by a desire to eradicate ignorance and vice, which he found rampant in the immediate vicinity of the local gaol of his native city, he determined to trace the moral malady to its primitive source. He discovered that in early life the education of those whom he found the inmates of gaols had been totally neglected; that they had never received any mental or religious instruction; and as a natural consequence he was led to infer that succeeding generations if trained in equal ignorance would probably prove equally vicious. Children at a tender age were sent to work on week days, and Sundays were devoted wholly to wickedness. He determined, if possible, to check this state of matters. In 1780 he made his first attempt at a Sunday school, and it soon awakened considerable attention. For nearly thirty years he continued to be actively engaged in the promotion of the undertaking, and he lived to witness its extension throughout England. A statue was erected to his memory on the Thames Embankment on the occasion of the celebration of the Sunday Schools Centenary in 1880.

Ramus, Peter. *See* REFORMATION.

Rates (School Board).—Board schools are supported partly by Government grants (*q.v.*), partly by school fees paid by the children, and partly by the local School Board rates. Mr. Forster, in introducing the Education Act of 1870, expressed the opinion that the administration of that measure would not impose upon the ratepayers a heavier burden than an average rate of 3*d.* in the pound. This estimate is frequently quoted by adverse critics of School Board finance. Mr. Forster, however, after some experience of the working of the Act, admitted that when he formed his estimate of the 3*d.* rate he had at the same time greatly under-estimated the educational destitution of the country, of which he had formed no adequate idea until after the Act came into operation. The average School Board rate in England in 1885–86 was 7*d.*; in 1884–85 it was 6·6*d.*; in 1883–84, 6·3*d.*; so that in three years the increase was ·7*d.* At the same time, however, the average number of children attending Board schools increased by 130,132. The total expenditure in 1886–87 for School Board purposes in England amounted to 5,124,661*l.* Of this total 2,442,347*l.*, or 47·7 per cent., was raised out of the local rates.

Ratich, Wolfgang (from *Ratichius*, the latinised form of *Ratke*) (1571–1635), is well known for his plan of teaching language, which created so much interest in Germany and elsewhere at the time of its publication. The following are some of the general principles or maxims on which Ratke based his practice. They are highly suggestive, but must be given here without comment: 1. Everything after the order and course of nature. 2. Only one thing at a time. 3. One thing should be often repeated. 4. Everything first in the mother tongue. 5. Everything without compulsion. 6. Nothing should be learnt by rote, if thoroughly understood and made familiar a thing will be remembered, as far as it is necessary to remember it, without rote-learning. 7. Due time should be allowed for recreation, and there should be breaks between lessons. 8. Mutual conformity (of method) in everything, e.g.

all grammars should be on the same plan, and universal grammar should be learnt in connection with the modern tongue. 9. First the thing itself, and afterwards what explains the thing—e.g. first the material for a rule, and then the rule ; or again, first a circle exhibited, and then its properties and definitions. 10. Everything by experiment and analysis. It has been the way with some to laugh at Ratke and to call him a charlatan. But Ratke was no fool. On the contrary, he was full of insight and originality, and possessed some of the very highest qualities of a skilful teacher. (See Dr. Henry Barnard's *German Teachers and Educators*.)

Ratio Studiorum. *See* JESUITS.

Raumer, Karl Georg von (*b.* 1783, *d.* 1865).—An eminent German writer on pædagogy, as well as on geology and geography. While studying in Paris in 1808 he became acquainted with the writings of Pestalozzi, and was so much struck with the improved method that reformer was introducing in teaching that he abandoned the mineralogical and other scientific studies he had up to that year been pursuing, and proceeded direct from the French capital to Iserten, where he acted as voluntary assistant in Pestalozzi's establishment from October 1808 to April 1809. He then returned to Germany with his enthusiasm somewhat sobered, but ever afterwards devoted a large share of attention to educational affairs. He was professor of geology, natural history, &c., successively at Breslau, Halle, and Erlangen, at which last place he died. The four years from 1823 to 1827 he spent as assistant to Dittmar at his educational establishment at Nuremberg, where he also founded an institution for the rescue and education of orphan and deserted boys. He was the author of numerous writings on several departments of the natural sciences, especially geology, geography, and geognosy, but his most important work was his *Geschichte der Pädagogik vom Wiederaufblühen klassischer Studien bis auf unsere Zeit*, originally published in three volumes between 1843 and 1851. In 1877 a fifth edition appeared in four volumes. This is one of the most valuable treatises ever published in the German language on the subject it deals with, and has been translated into English under the title of *History of Pœdagogy from the Revival of Classical Studies down to our own Times*. Although somewhat one-sided in dealing with theological matters, Von Raumer's treatise in the main shows such sound judgment and contains such numerous quotations from original documents and the older writers that it must long remain a standard work on pædagogy. The section on *Die Erziehung der Mädchen* (education of girls) was published separately in 1859, reaching a third edition in 1866. The chapters on *Deutscher Unterricht* (German instruction) were also edited and published as a separate work by the author's son, Rudolph von Raumer (*b.* 1815, *d.* 1875), professor of the German language and literature at Erlangen. The autobiography of Karl von Raumer (*K. v. Raumer's Leben von ihm selbst erzählt*) was also published after the author's death in 1866. Friedrich von Raumer, the celebrated historian (*b.* 1781, *d.* 1873), was a brother of Karl von Raumer.

Reader (University).—A university reader is practically a professor at Oxford and Cambridge. Readerships are outcomes of the last Commission. The stipend is generally about 300*l.* a year, the common funds being supplied by a kind of college income tax. For names and details *see* UNIVERSITY CALENDARS.

Reading.—Reading 'is the art of pronouncing words at sight of their visible characters' (Bain) ; the process of 'learning to recognise in written signs words which are already familiar to the learner in spoken language' (Currie). The eye and the ear of the pupil must be exercised together on the forms and sounds of letters and words ; and at an early stage the sense of the matter will come in aid of the sheer efforts of memory to retain the discriminations of eye and ear. Certain general preliminary conditions are accepted by most theorists :—(1) Before beginning to read the child should have considerable practice and facility of distinct enunciation of the vocabulary of early childhood ; (2) the first reading lessons ought to be formed from matter and words within the child's familiar knowledge and experience ; (3) they should be composed of complete sentences, precisely as the spoken language which the child knows consists of complete sentences. But at this point the general agreement ceases, and there is a division of methods.

I. *The Alphabetic Method.*—This method is so called 'because it associates

the sound of a word with its sign through the medium of the series of its letter-names, taken either collectively or syllabically.' The alphabet is first taken up. The first act is to distinguish the letters by the eye, and especially to discriminate such as are nearly alike—a process which is effectively helped forward by writing or drawing. Concurrently with this proceeding the child connects with the printed characters or letters their names, or vocal representations. The practice of giving the child small tablets, each of which has a letter on one side and a figure (of a well-known animal or other object whose name commences with that letter) on the other, is of ancient origin. Quintilian 'recommends the use of letters in ivory, which children take pleasure in handling, seeing, and naming' (Compayré's *History of Pædagogy*, transl. by Professor W. H. Payne, p. 49). St. Jerome similarly writes: 'Put into the hands of Paula letters in wood or in ivory, and teach her the names of them. She will thus learn while playing. But it will not suffice to have her merely memorise the names of the letters, and call them in succession as they stand in the alphabet. You should often mix them, putting the last first, and the first in the middle. Induce her to construct words by offering her a prize, or by giving her, as a reward, what ordinarily pleases children of her age. Let her have companions, so that the commendation she may receive may excite in her the feeling of emulation' (*ibid.* p. 67). Erasmus mentions that 'the ancients moulded toothsome dainties into the forms of the letters, and thus, as it were, made children swallow the alphabet' (*ibid.* p. 90). The same view is taken by Locke: 'Give me leave here,' he says (*Thoughts on Education*), 'to inculcate again what is very apt to be forgotten—viz. that great care is to be taken that it be never made as a business to him, nor he look on it as a task. I have always had a fancy that learning might be made a play and recreation to children, and that they might be brought to desire to be taught, if it were proposed to them as a thing of honour, credit, delight, and recreation, or as a reward for doing something else. Children should not have anything like work, or serious, laid on them; neither their minds nor their bodies will bear it. It injures their healths; and their being forced and tied down to their books, in an age at enmity with all such restraint, has, I doubt not, been the reason why a great many have hated books and learning all their lives after.' If possible, then, the judicious teacher will wile the child into learning to read, while it supposes it is simply playing. 'I know a person of great quality,' Locke goes on to say, 'who, by pasting on the six vowels (for in our language *y* is one) on the six sides of a die, and the remaining eighteen consonants on the sides of three other dice, has made this a play for his children, that he shall win who, at one cast, throws most words on these four dice; whereby his eldest son, yet in coats, has played himself into spelling with great eagerness, and without once having been chid for it, or forced to it. . . . When by these gentle ways he begins to be able to read, some easy, pleasant book, suited to his capacity, should be put into his hands, wherein the entertainment that he finds might draw him on, and reward his pains in reading. To this purpose I think Æsop's *Fables* the best, which, being stories apt to delight and entertain a child, may yet afford useful reflections to a grown man; and if his memory retain them all his life after, he will not repent to find them there, amongst his manly thoughts and serious business. If his Æsop has pictures in it it will entertain him much the better, and encourage him to read, when it carries the increase of knowledge with it; for such visible objects children hear talked of in vain, and without any satisfaction, whilst they have no ideas of them, those ideas being not to be had from sounds, but from the things themselves or their pictures. And, therefore, I think, as soon as he begins to spell, as many pictures of animals should be got him as can be found, with the printed names of them, which at the same time will invite him to read and afford him matter of inquiry and knowledge. And, if those about him will talk to him often about the stories he has read, and hear him tell them, it will, besides other advantages, add encouragement and delight to his reading when he finds there is some use and pleasure in it.' Locke does not seem to appreciate the difficulty that modern educationists have found in bridging the chasm between individual letters and letters as joined in syllables. He, no doubt, contemplates a much more deliberate study than is now permitted to

children in these days of steam-pressure and 'standards.' The combining operation at once brings us face to face with the consideration that the conventional names of the individual letters, when repeated in succession, hardly ever give anything even approaching to the conventional sound of the particular word or syllable : *rat*, as pronounced, is not recognisable in *r*, *a*, *t* (*ar-a-tee*), as spelled. Still, a certain association is very rapidly formed, and this association is certainly suggestive. But the plain fact is, that this method is not, and is not designed to be, a pure reading method ; it is 'a method for teaching reading and spelling simultaneously, and the reading through the spelling.' Dr. Currie points out clearly the real difficulty. 'That these branches should be taught together,' he says (*Common School Education*, par. 278), 'is obvious, since the labour requisite for learning the one may all be made available for learning the other. The objection to this method is, not that it combines the two, but that it does so in an unnatural and awkward manner ; so that, instead of helping, they interfere with each another. Spelling rests on a habit of the eye, which is best acquired as the result of reading ; this method, which inverts their proper relation, not only deprives the learner of the natural facilities which reading gives for spelling, but distracts his attention from the one thing with which he is supposed to be occupied, the reading.' The difficulty was recognised in the Port Royal method. 'What makes reading more difficult,' says Arnauld (*General Grammar*, chap. vi.), 'is that, while each letter has its own proper name, it is given a different name when it is found associated with other letters. For example, if the pupil is made to read the syllable *fry*, he is made to say *ef-ar-y*, which invariably confuses him. It is best, therefore, to teach children to know the letters only by the name of their real pronunciation, to name them only by their natural sounds.' He proposes, then, 'to have children pronounce only the vowels and the diphthongs, and not the consonants, which they need not pronounce except in the different combinations which they form with the same vowels or diphthongs, in syllables or words.' This brings us to the second method.

II. *The Phonic Method.*—This method differs from the alphabetic in associating the sound of the word with the letter *sounds* composing it, instead of with the letter *names*. It claims two conditions, however, as necessary for its efficient working : (1) 'It does not subject to phonic analysis those monosyllabic words which the child has occasion to learn first, because they are for the most part anomalous in their sound;' and (2) 'when it does enter upon analysis it groups the words of the language according to the vowel or diphthong sounds which they embody, that the learner may have all the help which results from classification' (Currie). Three objections have been offered to this method: (1) An exhaustive classification leads to a great complexity of rules, and, when all is done, no inconsiderable part of the language is left outside the rules. This objection applies with much greater force to English, which is phonically very irregular, than to such a language as German, whose phonic structure is regular. (2) Even within the regularities of the alphabet the aggregate of the sounds of the letters in a word does not really suggest the sound of the word itself ; it makes just a little nearer approach to this result than is attained by the alphabetic method. 'The pupil is expected,' says Dr. Currie (par. 279), 'to arrive at the sound of the word *bat*, for example, through this analysis, *bĕ-a-tĕ* (the two consonants being uttered upon a sound here denoted by *ĕ*, but which is in reality something like the sound of the *e* in French, or the *u* in *but*). This threefold sound may be a nearer approach to the single sound of *bat* than the threefold *bee-a-tee* of the alphabetic method, but it certainly does not constitute that sound. In fact it cannot.' (3) The third objection 'lies against its whole principle. It does not follow that, because the words of a language may have their sounds analysed and classified, the way to learn to read lies through this analysis and classification. Whether it does or not depends on the mental circumstances of the learner' (Currie, par. 279).

III. *The Phonetic Method.* — This method meets the irregularities of the alphabet by employing for a time a special alphabet provided with characters representing all the sounds of the language, and each possessing a uniform power. After a course of discipline in this alphabet the child is transferred to the ordinary letters by being set to read from a book printed

in the ordinary letters the same lessons as he has already learned in the phonetic characters. Against this method has been urged the same objection to its principle as we have seen urged against the phonic method, as well as two special objections: (1) It does not overcome, but only delays, the difficulty of mastering the irregularities; and (2) if introduced at all it would require to be introduced universally. Certain modifications have been proposed in obviation of these objections, such as special markings to differentiate the vowel sounds, and special modes of printing the difficult letters. But these would seem only to add to the young learner's confusion.

IV. *The 'Look-and-Say' Method*, or, *Reading without Spelling*.—This method directly associates the sound of the word with its form taken as a whole (*see* article LOOK-AND-SAY). The learner sees the word as he hears it—as a whole. Continuously, as his experience advances, he analyses the repeated association of sounds with signs, unconsciously perhaps at first, perhaps without much pointed attention at any time. 'This instinctive phonic induction he invariably makes for himself.' And the teacher may silently assist this operation of induction by grouping resemblances or directing special attention to such. 'This is phonic comparison, but it is a process very different from that contemplated in the "Phonic Method"' (Currie, 281).

In the system of Professor Jacotot this method was carried to a harsh extreme of practice, and was required to produce other important educational results besides mere reading. Jacotot advocated the principle, 'Learn something thoroughly, and refer everything else to it.' The pupil therefore is at once required to apply this principle, and is thus from the very outset compelled to observe likeness and unlikeness of words, 'to exercise his judgment, to analyse, to generalise, and, in short, to bring into play nearly the whole of his intellectual faculties.' Jacotot puts aside the usual apparatus of alphabets, primer, spelling-book, first reader, and so forth, and engages his pupil at once on some standard classical work, Fénelon's *Télémaque* for French children. Take the opening sentence: 'The grief of Calypso forthe departure of Ulysses would admit of no comfort.' The teacher points to 'The,' and pronounces it very distinctly, and the pupil repeats it after him. He then starts again and adds on the next word, 'The grief,' and the pupil repeats the two words after him. In like manner the third stage of trial includes the third word, and the fourth the fourth word, each stage having started from the beginning. The teacher now pauses, and exercises the pupil thoroughly in pointing out now this now that word, until he can infallibly distinguish them. The book is then opened at random, and the teacher points to some particular sentence, and requires the pupil to state whether he can recognise any one of his four words there. Assuming that the four words are thoroughly known, the teacher proceeds with the remaining words in the same way, always starting from the first. 'The process of interrogation pursued at the end of the first four words is repeated with each word of the sentence until the child learns accurately to distinguish those words which are different, to recognise the likeness between those which are similar, and to point out any word of this sentence in any page of the book that may be opened before him.' The teacher, having finished the sentence, now breaks up the words of more than one syllable into their component syllables, requiring the pupil to distinguish the syllables just as he distinguished the words; and by-and-by the same plan is applied to the letters. After a little the teacher ceases to pronounce the words first, and requires the pupil to attack his sentence with the training he has received, helping him only in cases where new words or syllables crop up. 'Still, however, he *must recommence with the first word learned*, as it is by this means only that all his previous acquisitions are permanently retained. He soon begins to have the first three or four sentences thus so frequently repeated impressed on his memory, and is told to spell them, dividing them into their component syllables and letters from recollection. After about sixty lines have thus been gone through, he cannot fail to be acquainted with nearly all, if not all, the letters of the alphabet, and with a vast variety of their combinations. It is indeed considered that he is now taught to read. If any hesitation, indicative of imperfect perception, is evident in the pupil, the master must return to the same words, syllables, or letters, until they are thoroughly distinguished and comprehended. By this means every new acquisition becomes permanent, and every

effort brings with it the proof of some progress. Hence there is no lost labour. If the pupil should learn only one word in an hour, yet is that word for ever learned and indelibly stamped on the memory by the *incessant repetition of the first thing required*, which is the very life of the system. The pupil is never to be assisted except in what is introduced to his notice for the first time. . . . The object of the process described is simply to make the pupil acquainted with the forms of words, syllables, and letters. What may be called declamatory reading is reserved for a more advanced stage of his progress, and the general rule given for the attainment of it is *Read as you would speak*' (J. Payne, *Lectures on Education*, pp. 349–351).

V. *The Phonic-Analytic Method.*—For all the warmth that is sometimes developed for or against the foregoing methods, there is practically not much difference between them. The great thing is to hold by the principle that 'the acquisition of both sound and sign should be based on a perception of the sense.' Perhaps the best of all methods is constructed from hints collected from all the preceding methods. This is the method of 'reading without spelling,' 'preceded by oral instruction in the use of words and in the forms of the letters, and supplemented after a time by a certain kind of phonic comparison.' It has been called the 'Phonic-Analytic' method; but Dr. Currie (who describes it admirably, par. 282) is content to call it simply 'Reading without Spelling,' in order to avoid confusion with the 'Phonic' method. It is exemplified with most careful elaboration in Professor Murison's *Globe Readers* (Macmillan).

Passing beyond the mere mechanical exercise of reading, we proceed towards *Elocution* (*q.v.*). Reading, to be good, must be intelligent and expressive—that is, it must bring out the sense of the matter, and do so with effect through skilful use of the tones of the voice. Intelligent reading is forwarded by everything that exercises and increases the power of the mind. Expressive reading has been analysed into the following chief elements: purity of utterance, distinctness of utterance, correctness of accent, deliberateness, correctness of pitch, modulation, fluency or facility. Instruction, imitation, and practice are all necessary conditions of success.

Simultaneous reading rests on the principle 'that the inferior readers of a class are compelled for the time to conform to the standard of the better readers.' It secures distinctness; it improves the rate, slowing the quick reader and quickening the slow; and it tends to remove asperities of tone and modulation (Currie, 291). With us the process is not profitably resorted to before the pupils have attained some mastery over the difficulties of reading. M. Renan states (*Vie de Jésus*) that Jesus doubtless learned to read and write according to the method of the East, which consists in putting into the hands of the child a book, which he repeats in concert with his comrades till he knows it by heart (Compayré, transl. Payne, p. 10).

The German methods of teaching reading sin more seriously than our own in mixing up with the strict reading exercise a number of other educational purposes, all good in themselves, but in this particular case misplaced. The following passage from Mr. C. C. Perry's *Reports on German Elementary Schools and Training Colleges* (Rivingtons) is of much interest in this connection: 'The reading-book,' says Mr. Perry (p. 103), 'occupies a central position in the instruction of the language. An especially thorough treatment is given to the normal subject-matter contained in the reading-book, as well as to the extracts intended for repetition, in the selection of which form, contents, and authors are to be the main considerations. With respect to the form, the pieces selected must represent the most important species of style, as well as the chief kinds of poetry. Their contents must be calculated to foster an ideal tendency in a boy's spirit, and to enlarge his range of thought, to render his mind active, and give a lasting impulse to his will. Amongst the authors, none of the more important national writers who are represented in the reading-book must remain unnoticed. The treatment which should be given to the pieces selected principally consists in (1) good reading on the part of the teacher; (2) explanation of difficult expressions, figurative modes of speech, &c.; (3) repeated reading, in which special attention is to be given to correct emphasis and expressive delivery; (4) stating the main

contents of a piece, and following out the different trains of thought; (5) a free and independent rendering of the contents (either in a concise or compressed form, or adding what can be read between the lines, paraphrasing the passage, putting it in different order, using different expressions, &c.); (6) written and oral exercises set in connection with the subject (such as imitations of style, detailed explanations of different expressions, synonyms, comparisons of two extracts, &c.). Requisite information is also to be given as to the form of the piece and its author. A number of the poems which have been discussed, especially those of a narrative form, are to be learned by heart. The remaining contents of the reading-book form the general reading material. They include, especially, extracts on history, geography, natural science, which serve to illustrate the instruction in these subjects, and are, as far as possible, to be treated in connection with them. Pupils must always read with correct pronunciation, logical accuracy, a good accent, and in an agreeable tone.' (*See* ELOCUTION.)

Realschule.—The *Realschule* is essentially a product of the nineteenth century. The political condition of Germany during the last decade of the eighteenth and the first of the nineteenth century, the impulse given to education by Pestalozzi, the fall of Napoleon, and restoration of general peace and prosperity—these were all factors in the movement. A general need was felt for 'modern education,' which should meet the requirements of a society in which art, science, trade, and industries were making rapid strides. There were many attempts at solving the educational problem of the times. In some places the municipal authorities founded *höhere Bürgerschulen*. The Bavarian Government opened *Realschulen* (1808). In other places the experiment of grafting modern subjects on to the old classical school (*Gymnasium*) was tried, but without much success. It became clear that a new type of school was needed, and the result was that after the War of Liberation a large number of *Realschulen* sprang into existence, for the most part without the assistance of the State. But the first beginnings of the *Realschule* must be sought in a much earlier time. The movement really began in the sixteenth century, under the influence of the new developments of physical science. Its early history is closely associated with the name of Bacon, who may be fairly said to have inspired much of the educational doctrine of Comenius. The educational ideal of the latter, as well as that of his disciple Francke, bore a distinctly modern stamp. The *Mathematical and Mechanical Realschule* of Semler, founded in 1706 in Halle, and reopened in 1738, was one of the earliest attempts at a technical school; the *Economical and Mathematical Realschule*, founded by Hecker in 1747 in Berlin, was a school of great importance, directed to giving a technical education in a number of special branches. These efforts, sporadic and transitory as they were, all contributed to the solution of the question of an education based on the practical needs of life. The writings of Rousseau and the philanthropists gave a farther impulse to the movement. But it was not till the year 1832 that the Realschulen received State aid in Prussia. In that year the Government took a tentative step towards reorganising and organising them, by providing for a fixed curriculum, and opening certain branches of the public service to pupils who had completed a full school course at a Realschule. These privileges were, however, made conditional upon the attainment of a certain proficiency in Latin, in addition to modern subjects; hence this language was generally introduced into Realschulen, at least as an optional subject. A still more important step was taken by the Government in 1859, when an improved scheme for the organisation of these schools was produced. A distinction was drawn between *Realschulen* of the first and second rank and *höhere Bürgerschulen*, according to the length of the school course, the character of the curriculum, and the equipment of the school in the matter of teachers and apparatus. The ideal at which these schools should aim was, according to the Prussian Government, a liberal education of a modern type. 'Their organisation should be based not upon the immediate needs of practical life, but on the aim of giving to their pupils that degree of intellectual capacity which is a necessary condition of a free and independent comprehension of their future work in life. They should not be technical schools, but should concern themselves, like the Gymnasia, with general culture. Between Gymnasium and Real-

schule there should be no difference of principle, but the two should be mutually complementary.' (*Unterrichts- und Prüfungsordnung der Realschulen und der höheren Bürgerschulen*, 1859.) This expresses the attitude which the Prussian Government has consistently maintained in regard to Realschulen. It was the attitude of Frederick the Great, who held that a purely utilitarian curriculum deprived a school of all title to rank as a High School. Thus reorganised, the Realschulen enjoyed increased prosperity, and it became clear to men of insight that Realschulen of the first rank would soon knock at the doors of the universities and demand for their alumni equal privileges with the pupils of Gymnasia. This demand many of the universities met by conceding the right to attend lectures (*Hörfreiheit*) —a right already enjoyed by many students from foreign countries who had not passed the leaving examination (*Abiturientenexamen*) at any Gymnasium. In 1870 the Government took action by throwing open to students who had passed the leaving examination at a Realschule the right of matriculating in the Faculty of Philosophy, which corresponds to our faculties of Arts and Sciences: this was equivalent to admitting them to the full privileges of a course in this faculty, with the right of entering for the degree of Ph. D. at the close of it. The State examination *pro facultate docendi* was also thrown open to *Realschüler* (pupils of a Realschule). Against this innovation the Philosophical Faculty of Berlin entered a vigorous and unanimous protest in the year 1880, maintaining that ten years' experience had shown bad results (*see* article CLASSICAL CULTURE). But the Government made no change in their policy, and in the year 1882 a new scheme was produced which confirmed the privileges of *Realschüler*, and at the same time effected a new classification of the schools before comprised under the names *Realschule* and *höhere Bürgerschule*. By this arrangement, which is in force at the present time, two classes of these schools are recognised. 1. Those which include Latin in their curriculum (*Realgymnasium*, *Realprogymnasium*); 2. Those which do not teach Latin (*Oberrealschule*, *Realschule*, *höhere Bürgerschule*). The Realgymnasium and Oberrealschule have, like the classical Gymnasium, a course of nine years; the Realprogymnasium and Realschule a course of seven years; the höhere Bürgerschule a course of six years. At the same time the curriculum of the classical Gymnasium was modified, the number of hours devoted to Greek and Latin was decreased, and Greek composition excluded from the leaving examination; time was thus found for more mathematics, French, and natural science. In the Realgymnasium more Latin is taught than in the old Realschule of the first rank, as organised in 1859, and less German, mathematics, natural science, and drawing. The Oberrealschule makes higher demands than the Realgymnasium in German, mathematics, natural science, drawing, French, and English; physiology and some technical department is added. The Oberrealschule is State-supported, and its pupils enjoy many privileges. If they pass a leaving examination in Latin, they are put on the same footing as pupils of the Realgymnasium. Similarly, if the latter pass a leaving examination in Latin and Greek equal to that imposed upon pupils of the gymnasium, they are admitted to equal privileges. The tendency of recent legislation has been to make the classical schools more modern in character, and the modern schools more classical. The result is that the distinction between some of the different kinds of schools is not very clearly marked. Of the modern schools popular favour inclines more to the Oberrealschule than to the Realgymnasium, which is in fact a kind of cross between a modern and a classical school. Whether the latter kind of schools will survive in the struggle for existence is an open question. In Alsace-Lorraine they have all been already abolished. But the future of Realschulen in the widest sense of the term is assured. (*See* L. Wiese, *Das höhere Schulwesen in Preussen.*)

Reason, Processes of Reasoning.—The faculty of reason is that by which we are able to infer from the known to the unknown, or to follow out the logical consequences of what we know. It is the higher part of man's cognitive or intellectual nature, and that which specially distinguishes him from the lower animals. Reason is sometimes (as by Kant) distinguished from the understanding, or faculty of judgment. In recent psychology, however, reason and judgment are brought together under Thought, or the thinking faculty, the operations of which include conception, judg-

ment, and reasoning. The first crude germ of reasoning shows itself in children's inferences from one fact of experience to another which resembles it more or less closely. At this stage, however, reasoning is hardly distinguishable from animal inference. It is only as the child gains abstract ideas, and is able to understand general propositions, that the process of human reasoning becomes distinct or explicit. Logic considers the reasoning process as falling into two main forms, deduction and induction. The education of the reasoning powers of the young includes a graduated series of exercises in each of these forms (cf. articles LOGIC, DEDUCTION, and INDUCTION).

Recitation.—Education consists partly in the acquirement of knowledge, and partly in the training of faculty. Besides learning facts, we must learn how to make use of them; while, again, if we would make use of knowledge, we must learn how to express it. The expression of knowledge in language is speech; or, when written, literature. *Recitation*, according to the common school use of the term, includes both the learning by heart of chosen pieces of prose and poetry, and the living utterance of them in speech. Besides leading to the mind's being stored with well-framed expressions of noble, wise, and beautiful thoughts, *recitation* is one of the means we employ for training the young to express what they know with right pronunciation, with clear significance, and with harmonious eloquence. The other means is oral reading. Now in order to express ourselves rightly and adequately in speech, we must not only *know* that about which we are to speak, but we must also *feel* it—or, if we but repeat the language of another, we must at least appreciate his position and point of view, as well as understand the subject-matter of what he says or writes. We must know and, for the occasion at least, feel his meaning. To recite the language of another, therefore, with full effect, we must not only commit his words to memory, but we must also know his subject-matter, understand his point of view, and appreciate his feeling. This shows us not only the value of *recitation* as one of the means of education, but also how we are to employ it. We must master the subject-matter and words; we must understand the situation and point of view; and we must appreciate the feeling of what we are to recite. Then we must learn how to give audible expression to these by means of the right tones, the right pauses, and the right accents. We must learn to use, in short, not only the instrument of speech —voice—with skill, but we must also employ our intellect and feelings. Some teachers seem to regard mere *verbal accuracy* in reproduction as everything. But accuracy in fact, though valuable in itself, counts for but very little in the total effect which good recitation ought to produce; and to gabble, however accurately, through a passage, however well composed, is like hammering on a piano with a closed fist. It would be well if *prose* were more frequently used for purposes of recitation. It is a little harder to remember than verse, but has a more direct practical bearing on everyday speech and everyday writing. *Collective* recitation might also be more commonly practised. An excellent effect is produced when an animated passage descriptive of action is recited by a whole class at once—especially when portions here and there can be taken up by single voices.

Recreation signifies such rest and change of occupation as will allow time for, and actually facilitate, the building up again of exhausted organs. Hence its great importance in relation to brain-work. An exciting game of chance or novel-reading may amuse, but will hardly produce that recreation which follows a vigorous walk or row, or a game at cricket or football. The importance of exercise has been discussed under PHYSICAL EDUCATION. The higher value of games over gymnastics is generally acknowledged. In the former the activity is spontaneous, and more conducive to general invigoration than the formal and less varied exercises in gymnastics. The more purely recreative the exercise, the greater the relief from school-work; running, leaping, rowing, swimming, cricket, rackets, tennis, and even football, under proper restrictions, have all their place and utility. Where playgrounds of insufficient size exist, gymnastics come in useful, and in all cases they are desirable to supplement games.

Recreative Evening Classes. *See* ADULT EDUCATION.

Rector.—I. A high dignitary in a *university*. Originally, the rector was the head of the nations' as nations. The

nations were divisions of members of the university grouped according to the countries or districts they came from—aggregations chiefly for purposes of discipline, and for mutual protection and defence of privileges. In the *University of Paris* there were four nations (including *masters* as well as students), each of which was a perfectly independent body, electing its representative procurator from its own number, having its own patron, church, meeting-place, and seal (quite separate from the university seal), passing its own statutes and rules, and superintending the lodging-houses of the students. The rector was elected by the four procurators; and rector and procurators, sitting as his assessors, together constituted the governing body The nations were in existence about the middle of the twelfth century, but their formal organisation as just outlined cannot be positively assigned to an earlier date than the first quarter of the thirteenth century. Meantime, the regulation of the studies was in the hands of the *consortium magistrorum*. By the year 1274 the rector had advanced to be, not merely head of the nations, but head of the faculty of Arts. 'After 1266, he might be elected either by the procurators, or by four men chosen for this special duty; and regulations made in 1281 evidently contemplated the possibility of the electors not being the acting procurators. In these regulations it is ordered that the electors shall be shut up in a room, and not allowed to communicate with the external world until a wax candle of a prescribed length is burned to the socket. If they have not decided by that time, other electors are to be chosen. If two of these agree, the outgoing rector is to be called in to give his vote with them, and so make a majority' (Laurie, *Rise and Constitutions of Universities*, p. 186, note). The rector was eligible from the *artistæ* (graduates in Arts) alone, in consequence of the superior antiquity of the Arts faculty; and he held office for three months (later for a year), but was re-eligible. He presided at the general meetings of the university, took charge of the register and public money, and administered generally the government of the university. In 1341 he is head of the whole university: the form *Nos rector et universitas magistrorum et scholarium* is found in use. The rector has ousted the original official head of the university, the chancellor of the primary theological school at Notre Dame, who retains but a fragment of his pristine authority, the conferment of degrees, together with some vague powers over the theological school. Within the city the rector's precedence was unquestioned; not only did all other officers and members of the university give way to him, but even bishops, papal nuncios, and legates also. At *Bologna* there were for long *two* rectors; it is not till 1514 that we find only one, and one seems to have been the rule before 1552. In the beginning of the thirteenth century (1200–1220) there were thirty-six nations (excluding the students belonging to the town of Bologna). The German nation was subject to two procurators of its own, and to them alone. The remaining thirty-five nations were grouped into two universities—*universitas ultramontanorum*, eighteen nations of students from beyond the Alps; and *universitas citramontanorum*, seventeen nations of Italians; and each of these corporations elected its own rector and other authorities. The rector was elected annually by the outgoing rector, the counsellors (*consiliarii* =*procuratores*) of the nations, and a certain number of electors specially appointed by the general body of the students. He was selected from the different nations in a regular order of succession. He must be not under twenty-five years of age; he must be a *clericus*, but not a member of any religious order; and he should have studied law for at least five years at his own expense. With each rector sat the eighteen, or seventeen, counsellors as assessors. 'The teaching doctors or professors, no less than the students, were subject to the rectors. A professor could not leave his duties for a few days without obtaining formal permission from him, and if the term of absence exceeded eight days he had to get permission from the whole university' (Laurie, 137). The rector's civil jurisdiction was clear as between two parties belonging to the university, or as between a scholar and a citizen who consented to sue the scholar before him; but when a suit against a scholar was brought before a city magistrate, and the rector claimed jurisdiction, violent conflicts not unfrequently arose, till ultimately the pope confirmed the university privileges. His criminal jurisdiction was generally limited to matters of academical discipline, and in 1544 the pope confirmed it in all cases

where both parties belonged to the university and the offence was not capital. The *University of Prague* presented a slight variation. 'The members of the university were divided into four nations. The highest official was the rector, who was chosen half-yearly. Each of the nations chose an elector; the four so chosen co-opted seven others, and the united body then selected five, by whom the rector was chosen. The office could not be filled by any one belonging to a religious order. The most important duty of the rector was urisdiction over all members of the university, not only in ordinary cases of discipline, but also in civil and in criminal processes. A court was held by him twice a week. His next most important duties were to see that the statutes of the university were observed, to take precedence in all functions of the university, and to administer its property' (Laurie, 258). In modern *Germany* the highest university official is the Rector Magnificus, who, when not a local magnate, is chosen yearly, or half-yearly, from among the ordinary professors who form the Senatus Academicus. Where custom has given the rectorship to the local prince or other magnate, then the acting official, elected from among the ordinary professors, is called pro-rector. The *University of France* is scarcely parallel. It is composed of seventeen academies, the heads of which bear the title of rector; they are appointed by the Minister of Public Instruction, and assisted by a secretary and staff of inspectors. In *England* there is no university official with the title of rector, except the heads of Lincoln College and Exeter College, Oxford. The chancellor retains his ancient pre-eminence. In *Scotland*, also, the chancellor is the formal head of the university, but the rector comes in next, and his election is mainly on the lines of the earliest universities of Europe. After various vicissitudes the order of election was settled by 21 & 22 Vict. c. 83 (1858), and the ordinances of the Scottish Universities Commissioners made and issued thereupon (*see* paper C. 3174 of 1863). At Aberdeen University the rector is elected by the matriculated students voting in four nations (Mar, Buchan, Moray, Angus), by four procurators, one procurator being chosen by and representing each nation; and in case of equality of the votes of the procurators the chancellor has a casting vote, provided he intimate his choice within twenty-one days from the day of election; and failing such intimation, the principal has the casting vote (Report of the Scottish Universities Commission, Ordinance No. 6). At Glasgow University the rector is elected by the matriculated students voting in four nations (Glottiana, Transforthana, Rothseiana, Loudoniana), the chancellor (or the principal) having a casting vote (as above) in case of equality of nations (Ordinance No. 3). At Edinburgh and St. Andrews the rector is elected by a general poll of the matriculated students, and in case of equality the casting vote of the chancellor or the principal (at St. Andrews the senior principal) decides (as above) (Ordinances Nos. 1 and 4). The rector holds office for three years, and names an assessor who sits with him. He is always a man of distinction, political, scientific, or literary; sometimes a popular local magnate. The Aberdeen and Glasgow students have recently done themselves honour by the election of ex-Professor Bain (*bis*) and ex-Professor Lushington. There is a strong feeling among the students that the rector should attend the meetings of the university court, of which he is president; and frequently a pledge to this effect is asked from candidates who live at some distance, sinecurist rectors being looked on with disfavour.

II. In *Secondary Schools*.—The heads of the 'higher class public schools' and of most other schools of secondary instruction in Scotland bear the title of rector. On the continent also a similar practice prevails to a considerable extent. (*See* Laurie's work generally; also Malden's *Origin of Universities*, and the references to original authorities there given.)

Reformation (The) in relation to Education.—Whilst Erasmus is to be regarded as the coryphæus of the Renaissance, the education of the Reformation is best represented by the names of Luther and Melanchthon. One of the logical consequences of the fundamental principles of the Reformation was the development of primary education. In attaching to each man the responsibility of his creed, and in placing the sources of faith in the Holy Scriptures, the Reformation contracted the obligation to put every person it had so splendidly and so perilously endowed in a condition to lay hold of the salvation to be found in the reading and the intelligence of the Bible. The necessity of ex-

plaining the Catechism and making comments upon it was for teachers an obligation to acquire the art of exposition and analysis. The study of the German mother-tongue and of singing was associated with the reading of the Bible in Luther's translation, and with religious services. Luther brought the schoolmaster into the cottage, and laid the foundations of the system which is the chief honour and strength of modern Germany: a system by which the child of the humblest peasant, by slow but certain gradations, receives the best education the country can afford. The purification and widening of education went hand in hand with the purification of religion; and the claims thus established by Luther to affectionate regard have been ever since indissolubly united in the minds of his countrymen. The Reformation contained, in fact, the germs of a complete revolution in education; for it enlisted the interests of religion in the service of instruction, and associated knowledge with faith. It is in virtue of this combination that for over three centuries the Protestant nations have led the van of human progress in the matter of primary instruction, the zeal for which, however, was by no means equally exhibited by all the leaders of Protestant reform. Melanchthon, for instance, who for his persevering labour in annotating classics and preparing editions of school-books, as well as for his practical activity in the direct processes of instruction, earned the title of *Præceptor Germaniæ*, worked more for high schools than for schools for the people. He was distinctly a humanist—above everything else, a professor of *belles-lettres*; and it was with chagrin that he saw his courses in the university of Wittenberg deserted by students when he lectured on the *Olynthiacs* of Demosthenes. He was so far in accord with Erasmus that, in 1522, he speaks of the signal folly of those 'who at the present day think that piety consists only in the contempt of all good letters, of all ancient erudition.' In the same year, and subsequently, Melanchthon implores Spalatin to have an especial care of the university, complaining that the students are rather overwhelmed than instructed by the mass of theological lectures. He accuses those who profess their dislike of profane letters as having 'no better opinion of theology, for this is only the excuse which they put forward for their laziness.' And in a declamation written by Melanchthon in 1557 he bewails in the strongest terms the decline of science and letters. In face of this evidence, and much more of the same kind, we can readily believe Erasmus when he says that it was easier to find professors than students to attend their lectures; that the booksellers declared that before Lutheranism came up they could sell three thousand volumes in less time than six hundred afterwards; and that at Strasburg and elsewhere there were those who thought that the only thing a theologian needed to learn was Hebrew. 'No doubt the old humanist,' says Dr. Beard, 'grew bitter in his last days, as he watched the triumphant progress of the movement from which he had deliberately turned aside. But it is plain that, in spite of Melanchthon, there was a tendency to go back to the spirit of a time at which it was considered a perilous thing for a Christian to read heathen books. But the tide of reviving interest in classical culture, which had been slowly gathering strength for a century and a half, was far too mighty to be even temporarily arrested by any defection of the Reformers. While they were occupied in internecine quarrels and the building up of rival systems of dogmatic theology, the work of recovering the mind of antiquity went steadily on. It was a longer and a more laborious task than from our present standpoint of culture we are easily able to conceive; and the men who accomplished it are not to be measured by the worth of their visible contributions to literature. When the convent libraries of East and West had been ransacked, and every fragment of ancient literature consigned to the safe keeping of the printing-press, the work was only begun. Texts had to be emended, grammars to be slowly compiled, the materials of dictionaries collected with almost infinite toil. The whole mass of learned tradition, on the basis of which a scholar now begins his work, had to be painfully brought together. When, by the labours of several generations, the philological part of the task was accomplished with tolerable completeness—when all educated men could read the classical authors in the original, and Greek and Latin were written by scholars with facility and even elegance—there remained

the work of reproducing the life of the ancients; of understanding their law, their worship, their military systems, their amusements; of re-writing their history, and reducing their chronology to order. And this was a toil which lasted through the eighteenth century, if indeed it can be said to be even yet at an end. Italy soon gave up her place in the van of classical culture. Her scholarship became mere phrase-mongering and Ciceronianism. Not what a man had to say, but how he said it, was the all-important thing; while platitude was no offence at all, solecism was a mortal sin.' There was a 'lack of moral fibre in the Italian scholars of the age of the despots: when Rome became serious under the influence of the counter-Reformation, humanists were warned off debatable ground, and bidden to employ their pens in her service, if at all. The study of Greek fell into disfavour; and when Jesuit influence came to predominate in schools and colleges, those admirable educators had practical ends of their own, which they cared for more than the progress of philology. So the literary hegemony passed to France and to Holland. Budæus, Turnebus, Casaubon, Salmasius, are the glories of French scholarship. If the Scaligers boasted an Italian descent, the elder lived and wrote in France; the younger and greater, who was Huguenot to the heart, taught in Leiden. It would be difficult to enumerate the many profound scholars who toiled in the universities of Holland to complete the long task the nature of which I have endeavoured to indicate. Their labours lie concealed in the grammars and dictionaries which to-day smooth the path of classical culture to our children; in the annotations which elucidate every difficult passage and explain every obscure allusion; in that knowledge of ancient life which is part of the intellectual air we breathe. The result was at once to restore that living connection with the mind of antiquity which Christian Europe deliberately abandoned in the sixth century, and to accumulate the materials upon which the higher and more constructive criticism of a later age has worked.'

Aristotle had been dethroned from his pre-eminence in the schools, and Melanchthon attempted to supply his place. He appreciated the importance of Greek, the terror of the obscurantists, and is the author of a Greek grammar. He wrote elementary books on each department of the *Trivium*—grammar, dialectic, and rhetoric—and made some way with the studies of the *Quadrivium*. It is also noteworthy that he wrote *Initia Doctrinæ Physicæ*, a primer of physical science. Horace was his favourite classic; and his pupils were taught to learn the whole of it by heart, ten lines at a time. 'He died in 1560, racked,' as Mr. Browning says, 'with anxiety for the Church which he had helped to found. If he did not carry Protestantism into the heart of the peasant, he at least made it acceptable to the intellect of the men of letters.'

The work of extending and diffusing popular education in Germany under the impulse of the Reformation and the personal influence of Martin Luther finds an instructive analogy in the same work in Scotland at the hands of John Knox (*q.v.*). The First Book of Discipline, drawn up by the great Scottish reformer, and presented to the Estates of Scotland, and subscribed by the Secret Council in the year 1560, contains Knox's Plan of Educational Organisation in Scotland, which provides for the equal distribution of the means and institutions of education among the whole population—recognising a gradation of schools, and (1) a primary school by every parish church, in which, in lack of a schoolmaster, the minister with his reader or clerk should 'take care over the children and youth of the parish to instruct them in their first rudiments, and especially in the Catechism;' (2) in all large parishes there was to be a good school, with a schoolmaster 'able to teach at least grammar and the Latin tongue;' (3) in the several towns which were centres of the superintendent's districts, there were to be colleges, where the students should be 'taught logic and rhetoric and the tongues;' and (4) universities. All of these schools were to be subject to inspection—the parochial and burgh schools by 'discreet, grave, and learned men, to wit, the ministers and elders, with the goodly learned men in every town, who shall every quarter make examination how the youth have profited.' They were charged 'to discover if there be a spirit of docility in any of the pupils,' and to direct such 'to further knowledge' in the colleges and universities; and those who do not show signs of fitness for higher

learning are to be taught some handicraft, or set about some other occupation. It was ordained that no parent of whatever condition may 'use his children at his own phantasy,' especially in the days of their youth, but must bring them up in learning and virtue; that the rich should be compelled to educate their sons at their own expense, but that the children of the poor should be supported at the charge of the Church, the sons of rich and poor alike, if they had aptness for learning, continuing at the schools until the commonwealth should have profit of them. It will be observed that this scheme separates the parish from the burgh or higher schools, and establishes grades of seminaries for conducting the scholar from the primary through the secondary schools to the universities; and that it provides also for the moral, intellectual, and technical training of the youth, places within the reach of the poorest child in the community, if he have 'vigour,' the blessings of a liberal education, and makes school attendance compulsory. If the Parliament had been liberal and patriotic enough to have seconded at that time the endeavours of the Church to plant, 'no country in the world,' as the late Principal Lee remarks in his *History of the Church of Scotland*, 'would have been so well supplied as Scotland with the means of extending the benefits of a liberal education to every man capable of intellectual improvement.' Educationists have called the outline of this system a perfect one—a plan, indeed, so far in advance of the times of its projectors, that we are *now* only attaining towards the high standard at which they aimed; and Dr. MacCrie, the biographer of John Knox, is justified in his sagacious inference that, in 'obliging the nobility and gentry to educate their children, and providing at the public expense for the education of the children of the poor who discovered talents for learning,' 'they seem to have had it in their eye to revive the system adopted in some of the ancient republics, in which the youth were considered as the property of the public rather than of their parents.'

The curriculum of the Scotch schools about the middle of the sixteenth century was in some respects broader than what is found in those of the nineteenth. At the Grammar School of Aberdeen, as appears from the statutes dated 1553, the boys were strictly forbidden to speak in the vulgar tongue; but only in Latin, Greek, Hebrew, French, and Gaelic. To show that the instruction was thorough and not confined to the embryo clergy, appeal may be made to a statement of Knox, who affirmed that, in a debate in Parliament in 1543, the lay members showed better acquaintance with Greek than the clergy. Classical knowledge continued for centuries to be the chief subject of instruction; but what are now called English and commercial subjects have little mention in the records of the larger grammar schools, although in the smaller ones reading and spelling were recognised from an early date. In Aberdeen, music appears to have been taught with more energy than in any other of the Scotch burghs. From an early date down to the end of the seventeenth century, music formed one of the regular branches of study, and was taught as a part of the ordinary curriculum. As time passed on it was found necessary to add reading and other subjects —as writing and arithmetic, which were somewhat late in attaining their proper place as branches of regular instruction— to the work; but as these became prominent the study of music receded, and the 'sang school,' which in pre-Reformation times was generally an appurtenance of the cathedral or the monastery, became a thing of the past. Religious instruction formed a prominent, if not an essential, part of the course of study pursued in the old burgh schools from the Reformation till the end of the last century. In 1567, Parliament declared that if God's Word be not rooted in the youth, their instruction shall be 'tinsell baith to their bodyis and saulis;' and in 1616 the Assembly ordained a catechism, to be made easy, short, and comprehensive, of which every family might have a copy for instructing the children and servants in the articles of religion. The municipal authorities were as willing as the ecclesiastics to enforce and to extend religious instruction; and this custom has not unreasonably been appealed to as having in no small degree contributed towards making a poor and thinly-peopled country not only one of the freest, most enlightened, and independent, but also one of the most prosperous in the world.

Thus it will be understood how it was that, partly in accordance with the na-

tional genius, and partly under the impulse of the Reformation and the direct or traditional authority of John Knox, the people of Scotland anticipated many of the political and educational cries of the present day. They recognised the necessity for education, and made it compulsory within certain limits. Fines and penalties were devised to counteract the negligence or indifference of parents. Substantial means were provided to furnish the various towns with good secondary schools, and the education was excellent of its kind. The qualifications of teachers were tested, and wise laws were made to secure their continued efficiency. Good salaries, respectful treatment, and consideration in the days of old age or infirmity were all adopted to encourage the teacher and retain the services of thoroughly qualified schoolmasters. The women were trained in domestic duties, and in those arts that tend to make the home a place of comfort. All these things combined to pour blessings on Scotland, and to achieve for her a reputation second to none for the excellence of her educational work. Although until lately there has been a dearth, and although there is even now a relative scarcity, of English works on the subject, it is not difficult to trace a picture of the education which the Reformation offered to the middle classes of Europe; for ample materials, even to such matters of detail as programmes and time-tables, are extant in German histories of education.

In following the history of education in the sixteenth century, however, it is necessary, as in other investigations, carefully to distinguish the theory from the practice. For theory, which is concerned with effort, and which stands for the ideal, the perfect, and consequently the unattainable, is not only generally in advance of the age in which it is conceived, but is always and necessarily in advance of practice, which is measured by result and approximation only, and which is kept back by the inharmonious working of variously impeded energies. The educational theory of the sixteenth century is to be found in the works of Erasmus, Rabelais, and Montaigne, of whom it may be said that before pretending to surpass them, even at this day, we should rather attempt to overtake them, and to equal them in most of the precepts of their ideal instruction. The practice of the time is to be found, first in the development of the study of the humanities, particularly in the early colleges of the Jesuits; and, before the Jesuits, in certain Protestant colleges, especially in the college at Strasburg, so splendidly administered by the celebrated Sturm (1507–89). Then it is to be recognised in the revival of the higher instruction, as emphatically denoted by the foundation of the College of France (1530), and by the brilliant lectures of Peter Ramus (Pierre la Ramée), who, having secured the reception and progress of his system of logic in the German universities, and the filling of France, England, and particularly Scotland, with his disciples, fell a victim to the massacre of St. Bartholomew's Day, 1572. Finally, it is the progress, not to say the birth, of primary instruction, through the efforts already referred to of the Protestant reformers, and especially of Luther.

The school of John Sturm (*Latinè* Sturmius) stood pre-eminently before the rest amongst those movements which were of vital influence in the development of the science of education. Situated in that border city on the debatable land between France and Germany, the school of Strasburg, which was first organised as a gymnasium in 1537, promoted in 1567 to the status of a college by the Emperor Maximilian II., and finally invested by Ferdinand II. in 1621 with the rights and privileges of a university, discovered how to combine and reconcile the peculiarities of French and German culture—the profoundness of the latter with the clearness and vivacity of the former. Sturm, who was one of the most variously accomplished and most universally informed men of his time, and who achieved the honourable *sobriquet* of the Cicero of Germany, was much consulted in the drafting of school-codes and in the organisation of gymnasia, and his treatise, *De Literarum Ludis recte aperiendis* (1538), and his *Classicæ Epistolæ: sive Scholæ Argentinensis restitutæ* (1565), addressed to the teachers of his own school, entitle him to a prominent place amongst the pioneers of the reformed education. He corresponded with Erasmus, Melanchthon, Bucer, and others, who in divers spheres and vocations were amongst the most distinguished men of his age. He was, in particular, the friend and correspondent

of Roger Ascham, the celebrated author of *The Schoolmaster* (1570), which has been repeatedly said to contain the best advice that was ever given, if, indeed, it did not incorporate the only sound method, for the study of languages. Sturm was ever keeping pace with those about him, learning Hebrew, for instance, in his fifty-ninth year, and inspiring his teachers with his own enthusiasm. He enjoyed the respect of the Emperors Charles V., Ferdinand I., and Maximilian II., as well as of Queen Elizabeth of England, the pupil of his friend Ascham. His fame as a teacher and educator was European; and the area from which he drew his scholars was co-extensive with his reputation. Whilst his pupils were among the men of mark throughout Germany, his halls were frequented by contingents from Portugal, Poland, and England. At one time there were two hundred noblemen, twenty-four counts and barons, and three princes under his instruction. In 1578 his school numbered several thousand students; he supplied at once the place of the cloister and the castle. Sturm was the first great head-master, the progenitor of Busbys, if not of Arnolds. What he most insisted upon was the teaching of Latin, not the conversational *lingua franca* of Erasmus, but pure, elegant, Ciceronian Latinity. Nowhere, perhaps, had he more effect than in England. Our older public schools, on breaking with the ancient faith, looked to Sturm as their model of Protestant education. His name and example became familiar to us by the exertions of his friend Ascham. Westminster, under the long reign of Busby, received a form which was generally accepted as the type of a gentleman's education. The Public Schools Commission of 1862 found that the lines laid down by the great citizen of Strasburg, and copied by his admirers, had remained unchanged until within the memory of the present generation. It is impossible to define exactly the extent of the formative influence of his doctrine; for besides directly organising many classical schools, his pupils rose to be head masters of many more, and his principles were embodied in the School Code of Würtemberg in 1559, and in that of Saxony in 1580, and in the educational system of the Jesuits.

In the first half of the seventeenth century, Wolfgang Ratke, Ratich, or Ratichius (1571–1635), a native of Wilster in Holstein, and Jan Amos Komensky (*Latinè* Joannes Amos Comenius) (1592–1671), a bishop of the Moravians, were, with very different degrees of merit, the heirs of the educational thought of Luther. (*See* article RATICH.)

The glory of applying the new spirit to actual practice must be surrendered by Ratich in favour of Comenius (*q.v.*), the son of a miller who belonged to the Moravian brethren. Comenius, who was born at the Moravian village of Comna, in 1592, and finally attained the dignity of being the senior bishop, or head of the church of the Moravian brethren, was for a long time unknown and unappreciated. Yet he is now recognised as the first who brought the mind of a philosopher to bear practically on the subject of education. Montaigne, Bacon, and Milton merely advanced principles, leaving others to see to their application. Michelet speaks of Comenius with enthusiasm as 'that rare genius, that gentle, fertile, universal scholar;' and he calls him the first evangelist of modern pedagogy—Pestalozzi being the second. It is not difficult to justify this appreciation. The character of Comenius is worthy of his intelligence. Through a thousand obstacles he devoted his long life to the work of popular instruction. With a generous ardour he consecrated himself to infancy. 'He wrote twenty works,' says Compayré, 'and taught in twenty cities. Moreover, he was the first to form a definite conception of what the elementary studies should be. He determined, nearly three hundred years ago, with an exactness that leaves nothing to be desired, the division of the different grades of instruction. He exactly defined some of the essential laws of the art of teaching. He applied to pedagogy, with remarkable insight, the principles of modern logic. Finally, as Michelet has said, he was the Galileo, we would rather say the Bacon, of modern education' (*see* article COMENIUS).

It is in the first grade of instruction, the school of infancy, the school by the mother's knee, the school of the maternal bosom, *materni gremii*, that the genius of Comenius is the most characteristically and most profoundly illustrated. And it was in this that the Protestant doctrine of individuality found its *ne plus ultra*; for it was this that was the final co-ordi-

nation of individual privilege and opportunity with individual peril, duty, and responsibility. 'The Reformers,' says Mr. S. S. Laurie, 'were educational philanthropists in the truest sense, and hence the people's school is rightly called the child of the Reformation. . . . To the same union of the theological with the philanthropic spirit was due the noble schemes of popular education embodied in the *Book of Polity of the Reformed Church of Scotland*, written so early as 1560.'

It is with Comenius, therefore, whose spirit is so faithfully reproduced, and the compass of whose design is so magnificently enlarged, in the winged and sonorous words of the *Tractate of Education* addressed by John Milton (*q.v.*) to their common friend Samuel Hartlib, that the consideration of the influence of the Reformation on education may be concluded—not that the impulse or genius of the Reformation had spent its force, but rather because in the system and method of Comenius may be found the germ, suggestion, and potentiality of all the principles, and all the applications of them, which have since been evolved in the course and the history of the movement. Approaching the subject quite independently, and looking at it from another and larger, although strictly analogous, point of view, the late Dr. Charles Beard 'regarded the English Reformation as having come to its close in the year 1662, when the Act of Uniformity at once settled the Church of England on a basis which has not since been disturbed, and necessitated the separate existence of Dissent.' It is observable that the year 1662 coincided with the seventieth year of Comenius, who died in 1671.

It is not to be supposed, however, that all the influences of the Reformation, and still less all its motives, circumstances, and accidents of detail, were directly favourable to education. Melanchthon's experience at Wittenberg, and the scathing denunciations of Erasmus, as called forth by the fanaticism of certain adherents of the Reformation who were intolerant of all learning which was not directly available in the interests of human salvation, have shown that in Germany, as in other Reformed or Reforming countries, a period of transition, or of scarcely completed achievement, is not the ideal foster period of intellectual or scholarly progress, or of full-orbed development. Naturally, it was the centres of the higher learning, and, within these centres, the most exquisite and most elegantly formative of the studies they affected, that chiefly suffered at the hands of persons whose prudence and spiritual anxieties led them to distrust and discredit, and proportionally to neglect, all erudition which was not negotiable on the exchange of an eternal world. In its most acute and virulent manifestation the jealousy which refused to detect the real divinity of any culture which was not formally or in terms theological did not hesitate to make bonfires of academical libraries, and to debase by uses more ignoble than destruction the literary treasures of antiquity. Even theology was not sacred, and in fact was occasionally the more obnoxious because it *was* theology; and books of patristic and scholastic divinity, of doctrine and discipline, were consumed in market-places and in learned quadrangles on the same pyres with treatises on useless mathematics and impertinent astronomy. The formula *delenda est*, once current in pagan Rome as applied to a rival for the secular supremacy of the world, was now turned against Rome herself, whose spiritual domination was to be scattered to the winds with the ashes of the literature she had tolerated and conserved, and to a certain extent assimilated and taught. But there were other reasons why the Reformation was not immediately helpful, but rather detrimental, to the interests of education, especially of the higher education—reasons which were not of the essence or the nature of the movement, and which, whether with or apart from the speciousness of pious pretence, are to be recognised in acts of diversion, spoliation, confiscation, and sacrilege. It has been alleged, indeed, that in Scotland, from divers causes, the Reformation extinguished learning; but the expression has more verbal point than literal accuracy. The statement is at once more moderate and more correct that in the ecclesiastical and political agitation of the sixteenth century the Scottish universities were the sufferers, and, with the triumphs of the new, or Protestant, party over the old Church, old incumbents of chairs and old sources of income were cut off, and although the universities obtained grants of Church lands, which were increased on the abolition of episcopacy in the next century, still the thorough reorganisation contemplated by

John Knox and James Buchanan in the First Book of Discipline was not effected.

With regard to the English universities, it is remarkable that the late Professor Huber, successively of Rostock, Marburg, and Berlin, a German and a Protestant, avers, as 'one undeniable fact,' that up to the time of the Catholic reaction under Mary 'the Reformation had brought on the universities only injury, outward and inward. There are a thousand results of this great revolution which we must needs deplore and disown. Its benefits are not to be looked for from the side of the universities at all, but in quite another quarter—in the deepening of spiritual religion. In contrast to the older Church, which was troubled with Pelagian elements, it established a purer evangelical doctrine; and this is its true glory. But in regard to the constitution and discipline of the Church, and the moral and scientific cultivation of the community, if it had any advantages over the old system, they are balanced by concomitant evils. The higher we estimate the spirituality of the Reformed doctrine the more are we authorised, and in duty bound, not to conceal the price at which this jewel was bought; the more also should we cling to the hope that the spirit of the truth so dearly purchased may at length penetrate and fashion the material frame which has received it.' What there was of reformation under Henry VIII. chiefly consisted in the spoliation of the monasteries, and the substitution of the royal for the papal supremacy. The former was so entirely a financial experiment as to be altogether unworthy of notice in any religious connection. Whatever may have been the sins and laxities of the monasteries, no one who looks at the character of the king, the agents whom he employed, and the uses to which the proceeds were put, can believe that they were dissolved in the interests of morality. The complaints of the most trusted exponents of contemporary discontent at the state of the universities about the middle of the sixteenth century are concerned in the first place with their general condition, and in the second with the character of their studies. Under the former head they deplore especially the irregular exercise of patronage, and the gradual disappearance of the non-collegiate or unattached element from the student body; and under the latter head they bewail the want of men who, by virtue of their recognised ability and mature experience, might stimulate and guide the younger students, and the injurious influence of theological polemics on genuine study. With reference to the relative injury done to the well-being of the universities, a passage of rough pathos occurs in a sermon preached at St. Paul's Cross in 1550 by Thomas Lever, who asserts that 'one courtier,' viewed as a despoiler, 'was worse than fifty tun-bellied monks.' 'How was it possible,' asks Professor Huber, 'in the midst of universal and increasing insecurity; when the violence and evil passions of the king broke out more and more immoderately; when all free religious movement, all free enquiry into the basis of religious belief, dwindled more and more away; when the burning pile was lit for Papist, Protestant, and enthusiast; when the University of Cambridge saw two of its chancellors, Fisher and Cromwell, perish on the scaffold; when, with the noble head of Sir Thomas More, virtue, religion, wisdom, and learning appeared all together to perish; while the most contemptible and hateful passions not only had free play, but, by help of most impudent hypocrisy, obtained legal validity and form;—how was it possible, we ask, for any freedom, peace, and liberty of the spirit to prevail, without which there can be no successful, intellectual activity at the universities?'

But so great a movement was not to be arrested by an occasional or incidental unreadiness of adjustment; and the minor impediments of progress were not to be treated as permanent or formidable obstacles to the march of a genius which was by hypothesis so variously resourceful as that of the Reformation. It was not long before the Protestant schools acquired the reputation of being the best in Europe. From this circumstance it results that the last phase in which the educational significance of the Reformation is to be considered is that in which it is seen in the process of provoking an activity outside its own borders, a counter-energy to its own of alienage and antagonism. The Roman Catholic Church showed herself sensitively conscious of the scholastic changes which the spirit of the time had made inevitable; and the challenge which had been thrown down by the champions of the Reformation was accepted with a smiling defiance by Ignatius Loyola and

his brethren of the Society, or rather his fellow-soldiers of the Company, of Jesus, who, in a time when defection and desertion were common and widespread, came forward to bind themselves by a vow of obedience to the Holy See, so absolute as to include their obligation to go into any country whither the pope might desire to send them, among Turks, heathen, or heretics, instantly, without discussion, condition, or reward. The new order was first authorised—with some limitations, as, for instance, with regard to numbers—in 1540 by Pope Paul III., who, three years afterwards, removed the original disabilities by a full and unreserved sanction.

The special function of the *Jesuits* was the threefold one of preaching, confession, and education. In discharge of their first obligation they engaged amongst each other to preach mainly for the common people, and to strive rather after impressive and touching discourse than after choice phrases. They affected the confessional on account of its intimate and immediate connection with the guidance and the government of consciences; and with regard to education they had desired to bind themselves to this occupation by a special clause in their vows. But, although they abandoned that design, they made the practice of the duty imperative by the most cogent rules. Their most ardent wish was to gain over the rising generation. The programme of studies, which dates from the latter part of the sixteenth century, and in which the most approved portions of the methods pursued in the schools of their predecessors or contemporaries in the art of teaching were incorporated, is in use, with certain modifications, in English Jesuit schools of the present day. Their extension and their success were extraordinary. As late as the year 1551 they had no firm station in Germany; in 1566 their influence extended over Bavaria and the Tyrol, Franconia and Suabia, a great part of the Rhineland and Austria, and they had penetrated into Hungary, Bohemia, and Moravia. About the middle of the sixteenth century the society had several colleges in France, particularly those of Billom, Mauriac, Rodez, Tournon, and Pamiers. In 1561 it secured a footing in Paris, notwithstanding the resistance of the Parliament, of the university, and of the bishops themselves. A hundred years later it counted nearly fourteen thousand pupils in the province of Paris alone. The College of Clermont in 1651 enrolled more than two thousand young men, and in 1695 had three thousand students. The middle and higher classes assured to the colleges of the society an ever-increasing membership. At the end of the seventeenth century the Jesuits could inscribe on the roll of honour of their classes a hundred illustrious names, including those of Condé and Luxembourg, Fléchier and Bossuet, Lamoignon and Séguier, Descartes, Corneille, and Molière. In 1710 the order controlled 612 colleges, 157 normal schools, 59 noviciates, 340 residences, 200 missions, 29 professed homes, and 24 universities. In Catholic countries they were the real masters of education, and they maintained their educational supremacy till the end of the eighteenth century. Various opinions are extant with regard to the merits of the system of the Jesuits. Bacon speaks of them in more than one passage as the revivers of the art of education, declaring of them, *inter alia*, that as to whatever relates to the instruction of the young we must consult the schools of the Jesuits, for there can be nothing that is better done. '*Ad Pædagogicam quod attinet*,' he says, '*brevissimum foret dictu*, Consule scholas Jesuitarum: *nihil enim, quod in usum venit, his melius.*' Descartes approved of their system, and Chateaubriand regarded their suppression as a calamity to civilisation and enlightenment. On the other hand, Leibnitz affirms that 'in the matter of education the Jesuits have remained below mediocrity;' and Voltaire declared that 'the fathers taught him nothing but Latin and nonsense.'

The Jesuits devoted themselves with great assiduity to the direction of their Latin schools; and it was, indeed, one of the principal maxims of Lainez, the first general of the order after its founder, that the lower grammar schools should be provided with good masters. With accurate discrimination he chose men who, when they had once undertaken this subordinate branch of teaching, were willing to devote their whole lives to it; for it was only with time that so difficult a business could be learned, or the authority indispensable to a teacher be acquired. Here the Jesuits succeeded to admiration; it was found that their scholars learned more in one year than those of other masters in two, and even Protestants recalled their children from distant gymnasia and committed

them to their care. Schools for the poor, modes of teaching suited to children, and catechising followed; and the whole course of instruction was given entirely in that enthusiastic and devout spirit which had characterised the Jesuits from their earliest institution. While the superiority of the Protestant schools lay in the greater freedom of spirit which characterised them, and the greater regard paid to the substance of literature, the great and distinctive excellence of the Jesuits consisted in the possession and the inculcation of a definite educational method. 'It was the want of method,' says Professor Laurie, 'that led to the decline of schools after the Reformation period; it was the study of method which gave the Jesuits the superiority that in many parts of the continent they still retain.' It is to their possession and exemplification of the same quality that the late Professor Ranke attributes their success—a success which, viewed in combination with its causes, seems to him to present a case perhaps without parallel in the history of the world. 'Without any striking manifestation of genius or originality,' he remarks, 'neither their piety nor their learning moved in any undefined or untrodden paths. They had, however, a quality which distinguished them in a remarkable degree—rigid method, in conformity with which everything was calculated, everything had its definite scope and object. Such a union of appropriate and sufficing learning with unwearied zeal, of study and persuasiveness, of pomp and penance, of widespread influence and unity, of a directing principle and aim, never existed in the world, before or since. They were industrious and visionary, worldly-wise and full of enthusiasm, well-bred men and agreeable companions, regardless of their personal interests, and eager for each other's advancement. No wonder that they were successful.' The Jesuits were probably the first to bring the teacher into close connection with the taught; but they are open to the accusation that the watchful care over their pupils, dictated to them by love, devotion, and self-sacrifice, degraded into surveillance, which lay-schools have borrowed from them, whilst their study of nature has led them to confession and direction. 'They have tracked out the soul to its recesses,' is the charge roundly brought against them by Mr. Oscar Browning, 'that they might slay it there, and generate another in its place; they educated each mind according to its powers, that it might be a more subservient tool to their own purposes. They taught the accomplishments which the world loves, but their chief object was to amuse the mind and stifle enquiry; they encouraged Latin verses because they were a convenient plaything on which powers might be exercised which could have been better employed in understanding and discussing higher subjects; they were the patrons of school plays, of public prizes, declamations, examinations, and other exhibitions, in which the parents were more considered than the boys; they regarded the claims of education, not as a desire to be encouraged, but as a demand to be played with and propitiated; they gave the best education of their time in order to acquire confidence, but they became the chief obstacle to the improvement of education; they did not care for enlightenment, but only for the influence which they could derive from a supposed regard for enlightenment.'

Another of the 'teaching congregations' which subsequently arose to exercise its benevolent functions within ecclesiastical limits, which were nominally Roman, was that of the Jansenists of Port-Royal. They were named after a Belgian theologian named Cornelius Jansen (1585–1638), who, devoting himself to the study of the Fathers, and especially of St. Augustine, wrote a treatise, entitled *Augustinus*, 1640, against the doctrine of freewill, and other heresies of the Pelagians and Massilians. The publication of this work, which is generally taken as marking the foundation of Jansenism in France, took place in 1640, two years after the death of the author, and exactly one hundred years after the first papal consecration of the Society of Jesus. From their earliest organisation the Jansenists manifested an ardent and affectionate solicitude for the education of youth; and in 1643 founded their *Petites Écoles* at Port-Royal des Champs, in the seclusion of the forests of Versailles. Here they commenced with only a small number of pupils, and developed their method as they proceeded; and 'here we find, for the first time in the modern world, the highest gifts of the greatest men of a country applied to the business of education.' Rivals and anta-

gonists of the Jesuits, they differed from the latter at once in their statutes, their constitution, and their destinies; and even to a greater degree in the motive and the spirit by which they were animated. 'For the Jesuits,' to quote the pointed antithesis of Professor Compayré, 'education is reduced to a superficial culture of the brilliant faculties of the intelligence; whilst the Jansenists, on the contrary, aspire to develop the solid faculties, the judgment, and the reason. In the colleges of the Jesuits, rhetoric is held in honour; in the *Petites Écoles* of Port-Royal it is rather logic and the exercise of thought. The shrewd disciples of Loyola adapt themselves to the age, and are full of allowance for human weakness; the recluses of Port-Royal are as severe upon others as towards themselves. In their suppleness and cheerful optimism the Jesuits are almost the Epicureans of Christianity; with their austere and somewhat sombre doctrine, the Jansenists would rather be its Stoics. The Jesuits and the Jansenists, those great rivals of the seventeenth century, yet face each other, and contend against each other, at the present moment.' The success of the Jansenists has seldom been surpassed; and, indeed, it was too much for the jealousy of the Jesuits. Neither piety, nor wit, nor virtue could save them. Persecution did not long grant them the leisure to continue the work they had undertaken. By 1660, when they had completed only some seventeen years of their career of instruction, the enemies of Port-Royal had triumphed, and the Jesuits obtained an order from the king closing the schools and dispersing the teachers. Pursued, imprisoned, exiled, the solitaries of Port-Royal were allowed to do little more than to consolidate in imperishable works the principles of a pedagogy which might have given an entirely different direction to the education of France and of Europe.

The roll of the great teachers whose community was graced by the polemical renown of Blaise Pascal includes also the names of Pierre Nicole, the moralist and dialectician, one of the authors of the famous *La Logique, ou l'Art de Penser*, and the writer of a treatise entitled *L'Éducation d'un Prince*, a series of reflections on education, and applicable, as he himself says, to children of all classes; of Claude Lancelot, the grammarian, the author of various *Méthodes* for learning respectively the Greek, Latin, Italian, and Spanish languages; and of Antoine Arnauld, called 'the Great,' the joint author of *La Logique* and of the *Grammaire Générale*, who also produced the *Règlement des Études dans les Lettres humaines*. Other names of less celebrated Jansenists are still worthy of mention, as, for instance, those of Lemaistre de Sacy, the author of various translations; of Coustel, who published *Règles de l'Éducation des Enfans*; and of Varet, the author of *L'Éducation Chrétienne*. Fénelon may be reckoned as belonging to the same school, but he was more fitted to mix and grapple with mankind. With regard to the relative durability and value of educational methods Professor Compayré judiciously observes that 'the merit of institutions should not always be measured by their apparent success. The colleges of the Jesuits, during three centuries, have had a countless number of pupils; the *Petites Écoles* of Port-Royal did not live twenty years, and during their short existence they enrolled at most only some hundreds of pupils. And yet the methods of the Jansenists have survived the ruin of their colleges and the dispersion of the masters who applied them. Although the Jesuits have not ceased to rule in appearance, it is the Jansenists who triumph in reality, and who have to-day the control of secondary education.'

To the same purport is the estimate of the work of the Jansenists and its abiding character and influence recorded by the judicial pen of the late Leopold von Ranke. 'Whilst the Jesuits,' he writes, 'were hoarding up learning in huge folios, or were losing themselves in the revolting subtleties of an artificial system of morals and dogmas, the Jansenists addressed themselves to the nation. They began by translating the Holy Scriptures, the Fathers of the Church, and Latin prayer-books; they happily avoided the old Frankish forms which had till now been so prejudicial to the popularity of all works of that kind, and expressed themselves with an attractive clearness of style. The establishment of a seminary at Port-Royal led them to compose school-books of the ancient and modern languages, logic and geometry, which, emanating from minds not trammelled by antiquated forms, contained new methods,

the merits of which have been universally admitted. . . . Men of the lofty genius and profound science of Pascal, of the poetical originality and perfection of Racine, and of the wide range of knowledge of Tillemont were formed within their walls. Their labours extended, as we see, far beyond the circle of ascetic theology which Jansen and Du Verger had traced. It would not be too much to assert that this union of men of high intellect and filled with noble objects, who, in their mutual intercourse and by their original and unassisted efforts, gave rise to a new tone of expression and a new method of communicating ideas, had a most remarkable influence on the whole form and character of the literature of France, and hence of Europe; and that the literary splendour of the age of Louis XIV. may be in part ascribed to the Society of Port-Royal.'

For the space of some two hundred years the educational systems of the Reformation, as well as of the Catholic world, suffered arrest, if not retrogression. From the general stagnation and the general pedantry which was the result, the colleges of the Jesuits, owing to their effective tradition of method, suffered less than those of their rivals or their confederates in the art and practice of instruction. So early as the latter half of the sixteenth century complaints loud and long, and proceeding from men of the highest intelligence, were rife as to the waste of time, the severity of the discipline, and the barbarism and intricacy of the grammar rules, which gave an evil tone to the schools of the period. There were, however, extenuating circumstances; for it has to be remembered that all Europe had been embroiled in civil and ecclesiastical contentions, and that the seeds of popular education and of an improved secondary system could not possibly have developed themselves in an atmosphere so ungenial. Indeed, until the remodelled school code of Saxony appeared in 1773, the dawn which had been so full of promise was overcast; the spirit that actuated the Reformers had died, and there had been a relapse into the old scholasticism. A couple of centuries were lost. Scotland alone, remote at least from continental imbroglios, and one of the typical centres of the Reformation—Scotland alone, as is claimed by one of her two Professors of the History, Theory, and Practice of Education, was during this period busily carrying out, in a truly national sense, the programme of the Reformation and the humanists; but this, in accordance with the genius of Protestantism, mainly on the popular side.

(Mr. Oscar Browning's article on 'Education' in the *Encyclopædia Britannica*, 9th edition; *American Journal of Education*, passim; Professor V. A. Huber's *Die Englischen Universitäten*, 1839–40; Rev. R. H. Quick's *Essays on Educational Reformers*, 1868; Mr. James Grant's *History of the Burgh Schools of Scotland*, 1876; Professor Gabriel Compayré's *Histoire de la Pédagogie*, 1881; Dr. Charles Beard's 'Hibbert Lecture' on the *Reformation of the Sixteenth Century*, 1883; Professor S. S. Laurie's *John Amos Comenius*, 2nd edition, 1884; Mr. James Bass Mullinger's *University of Cambridge, from the Royal Injunctions of 1535 to the Accession of Charles I.*, 1884; and others.)

Reformatory Schools are institutions for the reception and reformation of juvenile offenders under sentence for criminal offences. They were the outcome of the efforts of the Philanthropic Society, of which Sir Stafford Northcote (afterwards Lord Iddesleigh) was one of the most active members, and the first general law relating to them was passed in 1854, 'for the better care and reformation of youthful offenders in Great Britain.' This was followed by the Irish Act of 1858. Any juvenile offender convicted of an offence punishable with penal servitude or imprisonment, who, in the opinion of the court, justices, or magistrates before whom he is charged, is under the age of sixteen years, and who is sentenced to imprisonment for not less than ten days in Great Britain, and not less than fourteen days in Ireland, may also be sentenced to be sent, at the expiration of his period of imprisonment, to a certified reformatory school, to be there detained for a period of not less than two years, and not more than five years. Juvenile offenders are only sent to such reformatory schools as are under the exclusive management of persons of their own religious persuasion. A capitation grant is made by Parliament for the support of reformatory schools, and the usual average is about 5*s.* 11*d.* per head per week, the balance, about 1*s.* 6*d.* per week, being taken out of the local rates. In Great Britain there were in 1888 sixty-four reformatory schools, and in Ireland ten.

These schools include the 'Cornwall' ship off Purfleet, the 'Akbar' hulk and the 'Clarence' ship, both at Liverpool. The number of offenders committed to these reformatory schools in Great Britain in the year ended September 29, 1886, was 1,269, of whom 1,082 were males and 187 females. 79·7 per cent. of the total number committed were committed for larcenies or attempts to steal; 4·9 per cent. for housebreaking, shopbreaking, or burglary; and 5·6 per cent. for vagrancy. The remaining 9·8 per cent. were for various other offences.

Of the numbers committed in each of the three years, 1883–84, 1884–85, 1885–86, the percentage under the different degrees of instruction was as follows :—

	1885–86		1884–85		1883–84	
	Males	Females	Males	Females	Males	Females
Neither read nor write	19·3	24·1	22·2	18·0	23·8	36·2
Read or read and write imperfectly . .	72·7	58·8	66·6	61·9	66·3	47·5
Read and write well .	8·0	17·1	11·0	20·1	11·8	16·3
Of superior instruction	—	—	0·2	—	0·1	—

The total amount payable by Her Majesty's Treasury on account of the reformatory schools for the year 1885–86 was 66,660*l.* 10*s.* 10*d.*, being a decrease upon the amount for the year 1884–85 of 875*l.* 7*s.* 5*d.* The amount recovered from parents in 1885–86 was 5,030*l.* 16*s.* 7*d.*, being an increase of 213*l.* 6*s.* 1*d.* in comparison with the sum recovered in the previous year. The importance of making reformatory schools a part of the public penal system was first practically recognised by Massachusetts in 1848.

Registration.—In private schools, and in public schools above the elementary class, custom and convenience determine what registers shall be kept, but in public elementary schools registration is subject to definite and rigid rules. The books prescribed are an Admission Register, a Daily Attendance Register, and a Summary. (1) *The Admission Register* must be kept by the head teacher. It must show distinctly for each child admitted, its number, date of admission, full name, name and address of its parent or guardian, whether exemption from religious instruction is claimed, date of birth, the last school attended, highest standard in which it was there presented, the successive standards in which it is presented in the new school, and, lastly, the date of leaving. (2) *The Attendance Register* shows the daily and weekly attendances of each scholar throughout the school year. At the foot are entered, at each school meeting, the number present, and, weekly, the number on register, the number present at all, and the total number of attendances for the week. (3) *The Summary* shows for the whole school, class by class, and week by week, the numbers entered at the foot of the attendance registers. In Board schools a *Fee and Stock Book* has to be kept, in addition to the three books already named.

Registration of Teachers.—In all countries where education is regulated by the State it follows, almost as a logical consequence, that the State should impose some test of aptitude on its teachers. Thus in France there is the *brevet de capacité*, without which no primary teacher, whether public or private, can exercise his calling. There is likewise the *brevet de capacité de l'enseignement secondaire spécial*, which is compulsory on the secondary teacher who has not the degree of bachelor. In Germany the *Zeugniss* corresponds to the French teacher's *brevet*, and in nearly every Continental State some similar certificate is required. In England the certificate, or 'parchment,' of elementary teachers (*see* CERTIFICATED TEACHERS) is tantamount to registration, although only one-half of our elementary teachers have undergone any professional training (except as pupil-teachers), and no list of acting teachers is issued by the Education Department. On the other hand, for secondary teachers, whether in public or private schools, no credentials are demanded by the State, and till within quite recent years no attempt has been made either to provide for them a professional training or to exclude impostors from the profession. The movement in favour of the registration of teachers began rather more than a quarter of a century ago with an association, consisting mainly of private teachers, formed for the object of influencing public opinion in this direction, and ultimately obtaining an Act of Parliament. It was not, however, till 1869 that the subject of registration was brought before the Legislature. In that year Mr. Forster introduced, together with his Endowed Schools Bill, a second Bill for the organisation of higher education and the registra-

tion of teachers other than elementary, commonly known as Mr. Forster's Bill No. 2. This Bill met with little favour; it was regarded by the general public with indifference, supported only by a section of the profession, and suspected even by the Liberal party in the House as an unwarrantable interference with the liberty of the subject. But though it did not reach a second reading, it is of historical interest as the first assertion of the principle that it is the business of the State to supervise all education, and as tracing the main lines on which subsequent Bills have been drawn. The backbone of the Bill was an Educational Council, to whom the examination and registration of teachers were committed. In 1879 a Bill, which was promoted by the College of Preceptors, was introduced by Dr. Lyon Playfair. This Bill, commonly known as the 'Lyon Playfair Teachers' Registration Bill,' reproduced Mr. Forster's Educational Council, with one important change in its constitution. One-fourth of the council were eventually to be elected by the general body of registered teachers. Thus the council, instead of being a State department, tempered by university syndics, became, to a certain extent, a democratic and representative body. The same Bill, with some important modifications, was undertaken in 1881 by Sir John Lubbock. For the provisions of this Bill we must refer our readers to a pamphlet, *The Registration of Teachers*, by F. Storr (W. Rice, 1887), where the text is given as an appendix. Space will only permit us to call attention to some moot points raised by the Bill, and to indicate what are the present views and wishes of the profession. (1) Teachers are generally agreed that a Registration Act will be of little effect unless it is compulsory. The Medical Act affords a precedent exactly to the point. The first clause of the Teachers' Bill must run: 'No teacher, after a certain date to be fixed by the council, shall be able to recover tuition fees in a court of law unless his name is upon the register.' (2) For admission to the register some professional test must eventually be imposed. Here, again, there is an exact analogy between the teaching and the medical profession. (3) That all teachers, including the elementary, should be included in the register is greatly to be desired. There are practical difficulties in the way, but these would disappear if a Minister of Education were created. (4) The council to whom is committed the administration of the Bill should be elected mainly by the teachers themselves; but it is generally thought that delegates of the various educational bodies —the Universities, the College of Preceptors, the National Union of Elementary Teachers, &c.—would be preferable to direct representation. We may add, Lord Salisbury's Government, in a debate in the House of Commons (April 27, 1888), pledged itself to consider the Registration of Teachers in a forthcoming bill affecting secondary education. For further information see *Proceedings of International Conference on Education*, vol. iv. p. 136, and *Journal of Education*, Feb. 1888, containing Report of Conference of Teachers' Guild.

Religious Education.—All that this article is called on to deal with is the efforts made by the State, and the Churches, assisted by various benevolent societies, to arrange for or to further the suitable religious education of the classes who attend primary schools.

Even were it possible it would scarcely be advisable to attempt an account of the innumerable methods devised both in school and pulpit to meet the requirements of those who are in a position to choose for themselves the systems they consider best.

I. *The attitude of the State towards Religious Education.*—It has gradually come to be held as an axiom that the State has no direct concern with religious education. Secular knowledge the State is bound to give. Religious knowledge it leaves to the different denominations. The Government grants in England, Scotland, and Ireland are regulated on this principle. They are made (*a*) to denominational training colleges, (*b*) to primary schools.

(*a*) To the denominational training colleges the State contributes three-fourths of their annual expenditure, provided that expenditure is confined within certain strictly defined limits. The remaining fourth is contributed by the religious bodies under whose management the colleges are. In this way the State pays for the secular training of the teacher, but allows the utmost liberty of action to the denomination in the matter of their religious teaching. Of these

denominational training colleges there are in all fifty-three : forty-three in England, seven in Scotland, three in Ireland.

(*b*) *Government schools in England.*—The division of State-aided schools into School Board and Voluntary arises largely from the different regulations in force in each with regard to religious instruction. It dates from the passing of Mr. Forster's Act in 1870. The changes with regard to religious instruction introduced by the Act are comprehensively summed up by Dr. Rigg (*National Education*, chap. x.) as follows :—

'The new Act retained existing inspected schools, but it made a time-table Conscience Clause imperative in all schools in which religious instruction was given ; it also did away with all denominational classifications of schools, and with denominational inspection, treating all inspected schools as equally belonging to a national system of schools, and under national inspection, the distinction as to inspectors and their province being henceforth purely geographical. But the new Act no longer required that public elementary schools, established by voluntary agency and under voluntary management, should have in them any religious character or element whatever, whether as belonging to a Christian Church or denomination, or as connected with a Christian philanthropic society, or as providing for the reading of the Scriptures in the school. It was left open to any party or any person to establish purely voluntary schools if they thought fit. But furthermore, the Act made provision for an entirely new class of schools, to be established and (in part) supported out of local rates, to be governed by locally elected School Boards, and to have just such and so much religious instruction given in them as the governing Boards might think proper, at times preceding or following the prescribed secular school hours, and under the protection of a time-table Conscience Clause, as in the case of voluntary schools, with this restriction only, that in the schools *no catechism or denominational religious formulary of any sort was to be taught.*'

In the School Board schools so founded there is nothing derived from their constitution to prevent a considerable amount of religious instruction being given ; but the differences of opinion among the members of the Board are generally so marked, that it is not possible to agree upon anything further than the reading of the Bible without note or comment. (*See* SCHOOL BOARDS.)

In Voluntary schools the only restrictions as to the amount and nature of the religious instruction are (1) that such instruction must be given either before or after the time required for secular subjects, and (2) 'any scholar may be withdrawn by his parent from such instruction without forfeiting any of the other benefits of the school.' The full liberty thus allowed has been found, when properly employed, to permit of as thorough and systematic a religious education as could be given under any school system. It is on this account that the Voluntary schools are so highly valued and so warmly supported by those who are principally interested in religious education.

Government Schools in Scotland.—In *Scotland* the system of School Boards prevails very widely, though not exclusively. This is to be accounted for partly because it falls in with the tradition of Scotch education, partly also because there is no restriction in Scotland as to what religious instruction shall be given in the schools. A Conscience Clause similar to that in England protects individual liberty of opinion, but with this exception denominational teaching may be freely given. The Presbyterians have, therefore, no inducement to maintain separate schools, as the Board schools fully meet their requirements. The voluntary principle is, however, fully recognised. There is nothing to prevent the denominations retaining their schools under the Privy Council, and it is probable that Episcopalian and Roman Catholic schools will be permanently so retained.

In *Ireland* the provisions made by the National Board for Religious Education closely resemble those in force in the Voluntary schools in England. The schools are divided into two classes : (1) Those whose ownership is vested in the Commissioners of Education or trustees ; (2) those not so vested, whose ownership is retained by those who build them. The rule with reference to religious instruction is that, provided four hours are devoted each day to secular instruction, as much time as the manager wishes may be devoted to distinctly denominational teaching, either before or after secular school business, and

at one, but only one, intermediate time between the commencement and close of the secular school business. In Vested schools accommodation must be provided so that such pastors or other persons as shall be approved of by the parents or guardians of the children shall have access to them in the schoolrooms for the purpose of giving religious instruction there at times convenient for that purpose. In Non-Vested schools no such obligation exists. The teachers give whatever course of instruction the managers may approve; but all children whose parents disapprove of the course must be dismissed till the time for religious instruction is over. In cases in which the managers do not permit religious instruction to be given in the schoolroom, the children whose parents or guardians so desire must be allowed to absent themselves from the school at reasonable times, for the purpose of receiving such instruction elsewhere.

A special feature of the Irish system is that grants are made to monastery and convent schools, in which the teaching is done by the monks and nuns. There are upwards of 200 such schools, attended by upwards of 50,000 pupils.

II. *The Religious Education Work of the different Denominations.*—Leaving the passive attitude taken up by Government on the question of religious instruction, and proceeding to consider the work done by the different denominations and the societies in connection with them, we find great activity prevailing in all three countries. In *England* sectarian repugnance to the School Board system, with its prohibition of denominational formularies, has roused the Churches to strenuous exertions in support of Voluntary schools. A desire to develop to the utmost such religious teaching as the Board system does permit has led them to frame elaborate organisations for stimulating the earnest study of the Bible in Board schools.

(1) *Training Colleges*, as the means whereby religious influence may be brought to bear upon the schools, occupy a large share of attention. The Church of England possesses thirty. Of these one has been built and maintained by the Society for the Promotion of Christian Knowledge; three by the Home and Colonial Society (*q.v.*); three are the especial charge of the National Society (*q.v.*). The rest may be classed generally as diocesan, but almost without exception they are largely aided by the National Society. With a view to securing a high standard of religious knowledge, an inspector is appointed by the Archbishops of Canterbury and York to visit and report upon the colleges. There is also an Examining Board for Religious Knowledge, to examine the candidates for entrance to the colleges and the students in training. The Board consists of the archbishops' inspector, who is chairman, two representatives elected by the principals of the colleges for masters and mistresses respectively, of a member appointed by the Archbishop of Canterbury, of one appointed by the National Society, and of the secretary of the National Society. The Board is assisted by a staff of eight experienced examiners. All the expenses connected both with the inspector and the Board are defrayed by the National Society. The Society further pays a capitation grant to the colleges according as their students pass in first, second, or third class. This work is further assisted by the Society for the Promotion of Christian Knowledge, which makes grants of 2*l.* to all who pass in first-class and subsequently enter a recognised training college.

Of the other religious bodies the Wesleyans have two training colleges, the Congregationalists one, and the Roman Catholics three, the latter being largely supported by the Catholic Poor Schools Committee. In all these colleges special and earnest attention is paid to religious instruction. The Roman Catholic colleges have the advantage of a regular system of religious inspection provided by the Poor Schools Committee.

(2) *Schools.*—Great exertions are made by all denominations to maintain and develop the Voluntary School system. The following table taken from the *Year-Book of the Church of England* shows the large sums which are raised for the purpose:—

VOLUNTARY CONTRIBUTIONS.

Day schools, year ended August 31	1885			1896		
	£	s.	d.	£	s.	d.
Church . .	583,936	3	4	586,950	19	0
British, &c. . .	96,832	6	8	74,693	19	8
Wesleyan . .	15,934	7	11	15,691	9	2
Roman Catholic .	59,233	8	10	64,600	2	4
Board . . .	891	11	11	660	19	3
Total . .	756,827	18	8	742,597	9	5

In connection with the Church of England, in addition to diocesan and parochial efforts, the Society for the Promotion of Christian Knowledge and the National Society give large grants for building and enlarging schools. The work of testing the religious instruction in Church schools, which was discharged by the State until 1870, is now carried on by the Church itself. A large body of experienced examiners, acting in each case under instructions from the bishop of the diocese, are engaged in the work. The maintenance of these inspectors involves an expenditure of not less than 15,000*l.* a year on the part of the Diocesan Boards. Large grants towards the salaries of inspectors are made by the National Society. Prizes for proficiency in diocesan examination are given in many cases by the S.P.C.K.

The religious instruction given in Board schools is also the object of much attention. Grants are made by the Society for Promoting Christian Knowledge to promote the systematic religious instruction of Board school pupil-teachers in the dioceses of London and Rochester, and handsome exhibitions are awarded.

A large work with a similar object, but dealing with all the classes in Board schools, has been undertaken by the Religious Tract Society. Liberal prizes are offered for proficiency in Biblical knowledge, and immense numbers are induced to compete. As an illustration of the work, it may be mentioned that last year 228,021 children offered themselves for examination in connection with the London School Board, and prizes to the value of 500*l.* were distributed.

The Wesleyans, by means of the Committee of Education, watch carefully over the interests of their Voluntary schools. The severe competition of the Board schools prevents any great advance in the number of these schools; but the attendance at them has increased upwards of 25 per cent. There is a regular system of examination of pupil-teachers in religious knowledge in Wesleyan schools; but no general system of examination for the scholars.

The Roman Catholics, largely through the instrumentality of the Poor Schools Committee, have so successfully resisted the Board school system that not only has it made no inroad on their schools, but the number of their schools, the number of their teachers and the number of their pupils has been more than doubled since 1870. These circumstances are particularly creditable when it is remembered that the children of the Roman Catholic poor are among those least able to pay high school fees. The religious instruction in these schools is superintended and encouraged by means of a thorough system of inspection, on the results of which liberal prizes are awarded to pupil-teachers and others.

Sunday Schools.—The work done in Sunday schools forms a very important part of the religious education given by the different denominations. Since the Act of 1870, and the consequent spread of Board schools, the importance attached to Sunday schools has increased, and there has been a corresponding increase in their numbers and efficiency. In connection with the Church of England, the Sunday School Institute (Serjeants' Inn, Fleet Street, London, E.C.), since its foundation in 1843, has done much to extend and improve Sunday school teaching. It has now under instruction in England and Wales some 6,000,000 scholars, taught by nearly 600,000 teachers. The chief branches of the Institute work are (1) providing suitable lessons for the use of teachers. The books and papers issued with this object have attained a very wide circulation. (2) Instruction in the art of teaching. This instruction is given not merely in London, but by the deputation secretaries, who visit all parts of England and Wales, and some counties in Ireland, to lecture and give model lessons. Other important branches are the examination of Sunday school teachers at different centres, the founding and organising of branch associations all over the country, of which there are 363, and the publication of literature of all kinds suitable for helping on Sunday school work.

In connection with the various Dissenting bodies the following agencies exist for furthering Sunday school work: 'The Connexional Sunday School Union; (2 Ludgate Circus Buildings, London, E.C.), for Wesleyan Sunday schools; 'The Sunday School Association,' established 1833 (37 Norfolk Street, Strand, London, W.C.), and 'The Sunday School Union' (56 Old Bailey, London, E.C.), established 1803, not connected with any one denomination. The work done by the Sunday School Union is very extensive.

On its books it has nearly 150,000 teachers, and nearly 1,500,000 scholars. Its objects are (1) to stimulate and encourage Sunday school teachers at home and abroad to greater exertions in the promotion of religious education; (2) by mutual communication, and by means of a valuable training class held all the year round in London, to improve the methods of instruction; (3) to ascertain where Sunday schools are needed, and promote their establishment; (4) to supply books and stationery suited for Sunday schools.

In *Scotland*, the fact that distinct denominational teaching is permitted in the Board schools has made it possible to secure efficient religious teaching without such special effort as has been required in England.

Training Colleges.—The Church of Scotland and the Free Church manage between them six training colleges—four for masters and mistresses, two for mistresses. These Churches examine the candidates for admission to training in religious knowledge, and prescribe a course of study to be followed. They also examine the students at the end of each year of their course, and the results are printed. The Episcopal Church manages one college for masters and mistresses. The students receive the same religious instruction as is given in the English Church colleges, and it is tested by the same examiners. *Schools.*—Among Presbyterians the Board school system is universal. 'Use and Wont' secured before 1872 in the vast majority of schools the teaching of the Bible and the shorter catechism. Under the Act of 1872 the matter is wholly in the hands of the School Boards. As the result of the elections during all the years which have elapsed since 1872, 'Use and Wont' has been maintained. In a few isolated cases the catechism is not taught, but Bible teaching holds its ground. Many of the Boards in Scotland appoint examiners in religious instruction, who report to them. In addition, an association (office, 3A Pitt Street, Edinburgh) exists for the purpose of encouraging inspection in religious instruction, and some of the Boards avail themselves of its inspectors. The Episcopal Church maintains in all some seventy-five schools. Religious instruction is carefully given in them, and diocesan inspectors are employed to test the proficiency of the pupils in religious subjects. As the Poor Schools Committee represents in matters which concern elementary education Scotland as well as England, the account of its operations given above may be taken as referring to both countries.

Ireland.—(1) *Training Colleges.*—It was only in 1883 that the system of denominational training colleges was extended to Ireland. Up to this date the only place where teachers could be trained was at the College of the Commissioners of Education in Marlborough Street. This college has always been managed in accordance with the fundamental principle of the National Board, *combined* literary and moral, and *separate* religious instruction. Clergymen of the different denominations are permitted to visit and instruct the students separately at fixed times; at all other times no distinction whatever is made on the score of religion. This system was always profoundly distasteful to the Roman Catholics and a large section of the Church of Ireland, and the result was that most of the Irish teachers were untrained. When the offer of denominational training colleges was made by the Government in 1883, the Roman Catholics immediately founded one for masters and another for mistresses. In 1884 the Church of Ireland founded one for masters and mistresses. The religious instruction in the Roman Catholic colleges is managed by the college authorities. In the Church of Ireland Training College the candidates for entrance are examined by the college. The students in training are examined by the Board of the General Synod, as explained below. The Presbyterians and Wesleyans have as yet no training college. They get their teachers from Marlborough Street, and provide religious education for them by sending their catechists at such times as the Time-Table permits. (2) *Schools.* — Since disestablishment in 1870, the Church of Ireland has done much towards maintaining schools and improving the religious instruction given in them. The Church educational organisation consists of a Central Board appointed by the General Synod, and of Diocesan Boards appointed by the different Diocesan Synods. Most of the schools under Church management are in connection with the National Board. Of the

rest some, through not accepting the system of the National Board, remain in connection with the Church Education Society, a society originally formed to resist the advance of the National Board. Others, owing to the smallness of their numbers, can get no grants from the National Board, and have to depend upon grants from such sources as the Diocesan Board, the Erasmus Smith Board, the Islands and Coasts Society, the Ladies' Hibernian Society, and private benevolence. The Board of the General Synod and (with one or two exceptions) the Diocesan Boards work alike for all classes of schools. The Synod's Board provides the catechists for the Marlborough Street Training College, a work in which it is sometimes assisted by the English Society for the Propagation of the Gospel. It also organises, and with the help of the Irish Association for the Propagation of Christian Knowledge gives liberal prizes at, examinations in religious knowledge, held twice a year, for teachers in charge of schools, and also for the students of the Church of Ireland Training College. The Diocesan Boards, in addition to helping poor schools, have two important duties: (1) to provide diocesan inspectors to inspect national schools in religious knowledge, and other schools in both religious and secular knowledge; (2) to organise and give prizes for the annual diocesan examinations of Sunday and day schools. It has not as yet been found possible to appoint diocesan inspectors for all the dioceses, but, with scarcely an exception, the annual examinations have been everywhere organised with great success. Special examiners are appointed by the Boards, who make the tour of their diocese. The children come in large numbers to the different centres, and liberal prizes are awarded on the results of the examination. In connection with the Diocesan Boards a Church of Ireland Educational Association has been formed. By this association calendars of religious instruction, accompanied by notes for Sunday school teachers, are compiled. The calendars and notes are expected to circulate through the whole of the Irish Church.

The Sunday schools of the Church of Ireland are for the most part organised so as to work for the annual examination held by the Diocesan Boards. In the diocese of Dublin a system of lectures and examinations for Sunday school teachers is maintained by the Diocesan Board. In the northern and southern diocese Sunday school teachers avail themselves of the examinations of the English Sunday School Institute.

The schools of the *Presbyterians* and *Wesleyans* are placed under the National Board whenever their numbers make it possible. Diocesan inspectors are not employed. In the Presbyterian Church the rule is that every minister shall be responsible for his own immediate charge, and the Presbytery supervise him. A Committee of the General Assembly on Elementary Education exercises a general superintendence. In the Methodist Church the rule is: The schools shall be systematically visited by the ministers, and they are required to keep an account of such pastoral visits, to be handed to the chairman of their district. In each of the ten districts a minister is annually appointed to visit and inspect all the schools within his district. An Education Fund exists for helping schools too small to receive aid from the National Board. The supervision of the education work forms part of the duties of the General Committee of Management. Both among the Presbyterians and Wesleyans the Sunday school system is vigorously worked, and in most schools yearly examinations are held. *The Roman Catholics* have from the first used the National system of schools, and as a result they have splendid national schools all over Ireland, not even the most remote parts being excepted. The religious instruction given in these schools is closely watched and superintended. Besides the ordinary national schools the Roman Catholics have the convent and monastery schools referred to above. Their religious education is also largely assisted by the religious orders. Chief among these are the Christian Brothers. Their schools number nearly 100, and are attended by about 30,000 pupils. These schools are, of course, unreservedly denominational in character.

Renaissance (The) in its relation to Education.—Renaissance is a term which in its French and more current orthography is identical with its less commonly employed English form of Renascence, both being derived from the Latin verb *renascor*, to be born again, and both also being equivalent in general meaning to new birth, regeneration, or renewal, and applicable

in general to the revival of anything long extinct, lost, or decayed. It is more definitely and particularly used, however, to designate the transitional movement in Europe from the Middle Ages to the modern world, and especially the time of the revival of letters and the arts in the fifteenth century.

In order to appreciate the influence of the Renaissance on education, or, in other words, to understand the Renaissance as expressed in education, it is necessary to devote a few sentences to the methods of the latter before the advent of the day which, in the course of several antecedent ages, had been heralded at irregular intervals by auroras which were not of the morning. The education of the Middle Ages (*q.v.*), broadly stated, was alternatively that of the cloister or the castle. The two methods stood in sharp contrast to each other. The object of the one was to form and to furnish the young monk; of the other, to fashion and equip the young knight. It would be ungrateful indeed to forget the services rendered to education by many illustrious monasteries, in which the torch of learning was kept alight throughout the dark ages—as, for instance, those of Tours, Fulda, and Monte Cassino, the monks of which, and especially of the last, were distinguished, not only for their knowledge of the sciences, but for their attention to polite learning, and their acquaintance with the classics. They composed not only learned treatises on music, logic, astronomy, and the Vitruvian architecture, but they likewise employed a portion of their time in transcribing Tacitus and other masters of the ancient literature; and their example in these respects was followed, in the eleventh and twelfth centuries, with great spirit and emulation by many English monasteries. But the value, because the validity, of cloistered education was impaired by reason of the long hours which the pupils and the members of monasteries were required to abstract from their studies and to devote to elaborate and unfruitful ceremonies, to what Milton calls a 'tedious number of liturgical tautologies,' or rosarial iterations, or to other exercises which were often exacting, exhausting, and untimely.

The culture of the *Scriptorium* itself was to a great extent uncouth and mechanical. The discipline was hard, and was made purposely and conscientiously repulsive. The rod was the sole, or at least the sufficient, symbol of an educational *régime*, the guiding principle of which was that no training could be effectual which was not forbidding and distasteful, and that no worthy subject of instruction could be approached except through the portals of suffering. This forcible imposition of asceticism upon the learners induced in them a spirit of revolt against the teachers, and a disgust of the learning which they misrepresented. The seven 'arts' of monkish training signified the whole circle of subjects studied by those who desired and sought a liberal education. These extended to science as well as to art, and included grammar, logic, and rhetoric, which formed the *Trivium*—and arithmetic, music, geometry, and astronomy, which formed the *Quadrivium*. These two, the *Trivium* and the *Quadrivium*, combined to make up the seven years' course, the divisions of which have profoundly affected our modern training; and it is a survival of this classification, which was in vogue as early as the fifth century, that we still speak of the curriculum of arts at a university, and that students become graduates in 'arts,' as bachelors or masters.

So gloomy a view is taken of the monastic training of youth that to some students of history it would seem that the joy of human life would have been in danger of being obliterated if it had not been for the warmth and colour of a young knight's boyhood. He was equally well broken into obedience and hardship with the youthful student of the cloister; but the obedience was the willing service of a mistress whom he loved, and the hardship was the permission to share the dangers of a leader whom he emulated. Against the *Trivium* and *Quadrivium* which measured the achievements of reluctant monkish study, were set the seven knightly accomplishments of riding, swimming, shooting with the bow, boxing, hawking, playing chess, and weaving the verses of romance or tenderness. Every feudal court and castle was in fact a school of chivalry, in which the sons of the sovereign and his vassals, together commonly with those of some of their allies or friends, were reared in its principles and habituated to its customs and observances.

And, although princes and great personages were rarely actually pages or squires, the moral and physical discipline through which they passed was not in any important particular different from that to which less exalted candidates for knighthood were subjected. The page commenced his service and instruction when he was between seven and eight years old, and the initial phase continued for seven or eight years longer. He acted as the constant personal attendant of both his master and mistress. He waited on them in their hall and accompanied them in the chase; he served the lady in her bower, and followed the lord to the camp. From the chaplain and his mistress and her damsels he learned the rudiments of religion, of rectitude, and of love; from his master and his squires he learned the elements of military exercise, to cast a spear or dart, to sustain a shield, and to march with the measured tread of a soldier; and from his master and his huntsmen and falconers he acquired the mysteries of the woods and rivers, or, in other words, the rules and practices of hunting and hawking. When he was between fifteen and sixteen he became a squire; but no sudden or great alteration was made in his mode of life. The details of his service, however, acquired more dignity according to the notions of the age; and his military exercises and athletic sports occupied an always increasing portion of the day. He accustomed himself to ride the 'great horse,' to tilt at the quintain, to wield the sword and battle-axe, to swim and climb, to run and leap, and to bear the weight and overcome the embarrassments of armour. He inured himself to the vicissitudes of heat and cold, and voluntarily suffered the pains or inconveniences of hunger and thirst, fatigue and sleeplessness. It was then, too, that he chose his 'lady-love,' whom he was expected to regard with an adoration at once earnest, respectful, and, if possible, concealed. When it was considered that he had made sufficient advancement in his military accomplishments, he took his sword to the priest, who laid it on the altar, blessed it, and returned it to him. He was now eligible to become a 'squire of the body,' and truly an 'armiger' or 'scutifer,' for he bore the shield and armour of his leader to the field, and, what was a task of no small difficulty and hazard, cased and secured him in his panoply of war before assisting him to mount his courser or charger. It was his function also to display and guard in battle the banner of the baron, or banneret or the pennon of the knight he served, to raise him from the ground if he were unhorsed, to supply him with another—if need be, his own—if his horse were killed or disabled, to receive and keep any prisoners he might take, to fight by his side if he were unequally matched, to rescue him if captured, to bear him to a place of safety if wounded, and to bury him honourably when dead. And after he had worthily and bravely borne himself for six or seven years as a squire, the time came when it was fitting that he should be made a knight.

Perhaps in nothing is the difference between the two forms of education, those of monkery and chivalry, more clearly shown than in the relations to women respectively of the youthful monk and the youthful candidate for knighthood. The former was brought up to regard a woman as the worst among the many temptations of St. Antony, and his life, as of one surrounded and cared for by celibates, to be himself a celibate, knew nothing of domestic tenderness or affection. A page, on the other hand, was trained to recognise as his best reward the smile of the lady of the castle, or her frown as his worst punishment; and as he grew to manhood, to cherish an absorbing passion as the strongest stimulus to a worthy life, and the contemplation of female virtue in its most noble forms of illustration, whether these occurred within his own observation and experience, or had to be sought as glorified and idealised in romance, as the truest earnest of future immortality. Both these forms of education disappeared before the Renaissance and the Reformation. But it is not to be supposed that no efforts were made to improve upon the narrowness of the schoolmen or the idleness of chivalry. Certainly it cannot be said that the Church was indifferent to the cultivation and extension of such learning as she approved; and she claims to have shown from the earliest times, through her councils and prelates, an earnest solicitude for the enlightenment of the people. In the ninth century alone, more than twelve councils urged upon priests and people the establishment of schools, monastic or paro-

chial, for the culture of sacred and secular learning, the study of divine and human sciences; and from the beginning of the eleventh century the papal bulls and briefs took notice of the most minute details of management, even to the superintendence of the schools, so far as the age permitted. The Emperor Charlemagne (742–814) early turned his attention to the establishment of episcopal seminaries, to which he added grammar and public schools, as preparatory both to the seminaries and to secular professions. Not that they were confined to grammar, for they recognised the *Trivium* and *Quadrivium*; but grammar, in the sense of literature, seems to have been the principal subject of their teaching. These schools were established in connection with the cathedral or the cloister. Cardinal Newman regards it as probable that Charlemagne did not do much more than this; for, 'after all, it was not in an emperor's power, though he were Charlemagne, to carry into effect in any case, by the resources peculiar to himself, so great an idea as a university.' It is his merit to have 'certainly introduced ideas and principles, of which the university was the result.'

Whatever the necessary limitations of his power and influence, however, it is in the period of Charlemagne, as he helped to make it, that the common consent of experts finds the era which forms the true boundary line between ancient and modern history. The influences transmitted by the reforms and policy of Charlemagne were of greater permanence than the fabric of the empire itself, and in no respect have they had a more enduring effect than in connection with the history of mental culture in Europe. It is, indeed, not a little remarkable, that in this somewhat unduly neglected ninth century may be discerned, as in miniature, all those contending principles—the conservative, the progressive, and the speculative—which, save in the darkest times, have rarely since ceased to be apparent in the great centres of our higher education. It is chiefly as the scholar and the founder of schools that the great emperor must live with posterity. He found men ignorant and unwilling to learn; no schools or colleges existed in all Germany or Gaul, and the intellect of Europe had sunk into unwonted apathy. He filled his empire with seats of learning, and left behind him a throng of accomplished scholars—a generation of poets, historians, and progressive priests. 'Alcuin,' the English 'Restorer of Letters in France,' it has been said in a rapture of estimating the educational and the political movements of the Carlovingian period by their relative powers of perpetuation and survival—'Alcuin was greater than Charlemagne, and Erigena than Cœur de Lion.' While the priests instructed the children of the commonalty, the bishops performed the same office for youths of rank or of exceptional ability. Wilfrid, Archbishop of York, who was driven out of his splendid benefice in 668, received the sons of many great men who were sent to him for education, whether they were designed for clerical or lay pursuits. And Egbert, Archbishop of the same see, and a disciple of the Venerable Bede, 'loved to take under his care youths of good capacity, and, supporting them from his own purse, to guide them affectionately in the paths of learning.' Many other prelates zealously spent themselves and their substance in the instruction of youth.

In addition to cathedral, monastic, and parochial schools, there existed in the mediæval era what were known as 'chaptral schools,' which seem to have been generally under a mixed jurisdiction, and the authority over which was vested in varying proportions, co-ordinately or with a correlative superiority and subordination, in lay or clerical individuals or corporations. Still other schools existed in various parts of Europe, unconnected with any organisation, though generally directed by monks or clergy. 'Such were the schools,' says Mr. Leicester Ambrose Buckingham, 'founded by the Counts of Raperschwil, in the neighbourhood of St. Gall, which, though independent of the abbey, were protected and encouraged by the monks; such were the schools which flourished in some parts of England in the reign of Henry III., of which FitzStephen makes mention of three established in London, and holding high repute for learning; such were probably the eight schools which Lothaire I. founded in 823, in the principal towns of Italy; such were the schools for the poor which were frequently created by pious benefactors, as the École des Bons Enfants, which existed at Rheims from the thirteenth century, the esta-

blishment bearing the same name at Brussels, which was endowed by Pierre Van Huffele, Chaplain of St. Gudule, in 1358, with all his property, and farther enriched in 1377 by Jean t' Serclaes, Archdeacon of Cambray, who provided it with the means necessary for the lodging and nourishment of twelve poor scholars between the ages of nine and eighteen years, and the many similar foundations which existed in other parts of Europe; such also were the schools of the Hieronymites, a pious confraternity bearing considerable resemblance to the Christian Brothers of modern days, and instituted by Gerard Groote in 1396, whose establishments were numerously diffused throughout Central Europe.'

'Benefactors and patrons,' says Cardinal Newman, in continuation of his remarks on the inability of Charlemagne to found a university, 'may supply the framework of a *Studium Generale*; but there must be a popular interest and sympathy, a spontaneous co-operation of the many, the concurrence of genius, and a spreading thirst for knowledge, if it is to live. Centuries passed before these conditions were supplied, and then at length, about the year 1200, a remarkable intellectual movement took place in Christendom; and to it must be ascribed the development of universities.' These institutions are usually considered to have grown out of the schools which previous to the twelfth or thirteenth century were attached to most of the cathedrals and monasteries, providing the means of education both to churchmen and laymen, and bringing together the few learned and scientific men who were to be found in Europe. On all hands it is admitted that the new intellectual impulse sprang up, not only on the domain and under the guidance of the Church, but out of the ecclesiastical schools; to whose teaching of the *Trivium* and the *Quadrivium*, the seven liberal arts, the Scholæ Majores added medicine, law, and theology. 'From Rome as from a centre,' to quote the bold directness of Cardinal Newman, 'as the Apostles from Jerusalem, went forth the missionaries of knowledge, passing to and fro all over Europe; and as metropolitan sees were the record of the presence of Apostles, so did Paris, Pavia, and Bologna, Padua and Ferrara, Pisa and Naples, Vienna, Louvain, and Oxford, rise into universities at the voice of the theologian or the philosopher.' In the latter portion of the mediæval epoch the universities arose in considerable abundance; so that not less than fifty-six were founded in Europe before the close of the fifteenth century. As all these institutions, like the schools from which they were developed, were the daughters of the Church, so their teaching perpetuated and petrified, as jealousy and narrowness and intolerance, the spirit which in earlier times had appeared as self-preservation, and had led so largely to a cenobitic or eremitical seclusion, protected by the horrors, difficulties, or inaccessibilities of nature from 'the world' of the period, which was at once vile, cruel, and persecuting, to confront or to challenge which, by way of antagonism, was probably death to the body, and to come into accommodating contact with which was certainly corruption, and probably death, to the soul. The very graces and refinements of such a society were to be withstood, even in their resurrection after centuries of abeyance and purgation and in the midst of another 'world in which the Church marched at large with the pomp and dignity of a triumphal procession.

Yet the power of the Church when brought face to face with the Renaissance fell short of omnipotence, and her influence of universality. Some of the most pious of her educational agencies and organisations were paralysed by the evolution of a bigotry which was often in the direct ratio of their devotion and singleness of heart and purpose. Thus the exemplary Brethren of the Common Life, the best known name among whom is that of Gerard Groote, and who devoted themselves with all humility and self-sacrifice to the education of children, had not, with all their purity and sweetness, sufficient strength to preserve amongst the necessary developments of the age the supremacy they had enjoyed for a hundred years. They could not support the glare of the new Italian learning; they obtained, and in a certain sense it may be feared that they deserved, the title of Obscurantists. The *Epistolæ Obscurorum Virorum*, the wittiest squib, notwithstanding its breadth and exaggeration, of the Middle Ages, which was so true and so subtle in its satire that it was hailed as a blow struck in defence of the ancient learning, consists

in great part of the lamentations of the Brethren of Deventer over the new age, which they could neither comprehend nor withstand. Mr. Oscar Browning very reasonably affirms the education of the Renaissance to be best represented by the name of Erasmus, that of the Reformation by the names of Luther and Melanchthon. Erasmus has been called the 'Voltaire of the Renaissance,' a partial truth, obscuring a vast difference which cannot properly be forgotten. For although Erasmus inveighed against the clergy as 'an obscurantist army arrayed against light,' he did not attack the Church, in which, were it not free from the polemical strife and the party excesses which his soul abhorred, he hoped to enjoy the delights of a revived literature in a new Augustan age. Concurrently with the great name of Erasmus it is proper in this connection to mention those of Vittorino de Feltre, who died in 1477, after having reached the highest point of excellence as a practical schoolmaster of the Italian Renaissance, and of Count Baldassare Castiglione, the author of *Il Libro del Cortegiano*, or *Book of the Courtier*, in which he portrays a cultivated nobleman in those most cultivated days. 'He shows,' says Mr. Browning, in a convenient summary of his doctrine, 'by what precepts and practice the golden youth of Verona and Venice were formed, who live for us in the plays of Shakespeare as models of knightly excellence.' For our instruction it is better to have recourse to the pages of Erasmus. He has written the most minute account of his method of teaching. 'The child is to be formed into a good Latin and Greek scholar and a pious man. He fully grasps the truth that improvement must be natural and gradual. Letters are to be taught playing. The rules of grammar are to be few and short. Every means of arousing interest in the work is to be fully employed. Erasmus is no Ciceronian. Latin is to be taught so as to be of use—a living language adapted to modern wants. Children should learn an art—painting, sculpture, or architecture. Idleness is above all things to be avoided. The education of girls is as necessary and important as that of boys. Much depends upon home influence; obedience must be strict, but not too severe. We must take account of individual peculiarities, and not force children into cloisters against their will. We shall obtain the best result by following nature. It is easy to see what a contrast this scheme presented to the monkish training—to the routine of useless technicalities enforced amidst the shouts of teachers and the lamentations of the taught.'

It is difficult for students of education to attach too much importance to this great revolution. For nearly three centuries the curriculum in the public schools of Europe remained what the Renaissance had made it, although the signs are scarcely ambiguous that we have again entered on an age of change. 'The Renaissance,' observes the Rev. Mark Pattison, in his *Isaac Casaubon*, 1559–1614, 'had dealt with antiquity, not in the spirit of learned research, but in the spirit of free creative imitation. In the fifteenth century was revealed to a world, which had hitherto been trained to logical analysis, the beauty of literary form. The conception of style or finished expressions had died out with the pagan schools of rhetoric. It was not the despotic act of Justinian in closing the schools of Athens which had suppressed it. The sense of art in language decayed from the same general causes which had been fatal to all artistic perception. Banished from the Roman empire in the sixth century, or earlier, the classical conception of beauty of form re-entered the circle of ideas again in the fifteenth century, after nearly a thousand years of oblivion and abeyance. Cicero and Virgil, Livius and Ovid, had been there all along; but the idea of composite harmony, on which their works were constructed, was wanting. The restored conception, as if to recoup itself for its long suppression, took entire possession of the mind of educated Europe. The first period of the Renaissance passed in adoration of the awakened beauty, and in efforts to copy and multiply it.'

Under the reawakening of this sense of beauty it happened that the classics, however they might be prized for their matter, were valued above all things for their form and expression. In this spirit the scholars of the Renaissance did all they could to discourage translations. Thus it happens that in the period of change, when Europe was rearranging its institutions, men who were most influential in education were entirely fascinated by beauty of expression as exemplified in two ancient languages. To such men the one

thing needful for the young seemed to be an introduction to the study of the ancient writings. Education became in consequence a mere synonym for instruction in Latin and Greek, and the only ideal of culture was that of the classical scholar. From this it followed that acquirement was placed before achievement. The highest distinction was awarded to the student of other men's words and other men's thoughts, so that doing and thinking came to be considered of far less importance in education than learning and remembering. Thus the scholars of the Renaissance, 'notwithstanding their admiration of the great nations of antiquity, set up an ideal which those nations would heartily have despised. The schoolmaster very readily adopted this ideal; and schools,' Mr. Quick complains, 'have been places of learning, not training, ever since.'

Such an ideal was, in the nature of things, generally impossible of attainment except to the rich and leisurely, who alone possessed the opportunities necessary for its effective contemplation. In practice the learned ideal has the further disadvantage of offering no compensating benefit for rudimentary efforts, and it knows little or nothing of proportional rewards for intermitted study, interrupted advance, or arrested approach. The first stage, the study of the ancient languages, is so totally different from the study of the ancient literatures to which it is the preliminary, that the student who never goes beyond this first stage either gets no benefit at all, or a benefit which is not of the kind intended.

It is almost a corollary from the enthusiasm for literature as an exclusive educational instrument, that literature, properly so called, is forbidden to the schoolroom, in which the subject of instruction is not so much the classics as the classical languages. That which is to be effectively the literature of the young must have its form and expression in the vernacular.

The ideal of the Renaissance, again, in its relation to education, 'led the schoolmasters,' to quote further from the objections of Mr. Quick, 'to attach little importance to the education of *children*. Directly their pupils were old enough for Latin grammar the schoolmasters were quite at home; but till then the children's time seemed of small value, and they neither knew nor cared to know how to employ it. If the little ones could learn by heart forms of words which would afterwards 'come in useful,' the schoolmasters were ready to assist such learning by ready application of the rod; but no other learning seemed worthy even of a caning. Absorbed in the world of books they overlooked the world of nature. Galileo complains that he could not induce them to look through his telescope, for they held that truth could be arrived at only by comparison of manuscripts. No wonder, then, that they had so little sympathy with children, and did not know how to teach them. It is by slow degrees that we are breaking away from the bad tradition thus established, and getting to understand children, and, with such leaders as Rousseau, Pestalozzi, and Froebel, are investigating the best education for them. We no longer think of them as immature men and women, but see that each stage has its own completeness, and that there is a perfection in childhood which must precede the perfection of manhood just as truly as the flower goes before the fruit.' (*See* articles on 'Education,' by Oscar Browning, and 'Knighthood,' by F. Drummond, in *Encyclopædia Britannica*, 9th edition; Leicester A. Buckingham's *Bible in the Middle Ages*, 1853; Cardinal Newman's *Historical Sketches: Rise and Progress of Universities*, 1873; Rev. Mark Pattison's *Isaac Casaubon*, 1875; J. Bass Mullinger's *Schools of Charles the Great and the Restoration of Education in the Ninth Century*, 1877; Rev. R. H. Quick's 'Renascence, and its Influence on Education' in *Education: an International Magazine*, September and November 1880.)

Research, Endowment of.—For something like a quarter of a century the public mind has been becoming more and more familiarised with the idea of the endowment of scientific research, and at the same time the idea of 'science' has been acquiring a wider meaning. Indeed, the question has now almost assumed the form: Shall the prosecution of learning in all its great branches be assisted more liberally and more systematically? The supreme national importance of the question is acknowledged by all, although with very wide discrepancy as to the value of particular studies. Unless we gird up our loins we shall be outstripped by our continental neighbours. The great difficulty

is whence to find the indispensable money; minor, yet not inconsiderable, difficulties are to find the right men to endow, and to work out a scheme for the regulation of the endowment. Considering the enormous masses of money available for the promotion of learning at the university seats, public men naturally resist any claims on the public treasury until the universities and colleges have turned their wealth into channels that accord with the modern spirit and with modern deeds, and yet can show a clear case for public consideration. Academic conservatism is naturally strong, and it is powerfully backed up by the last wishes of the pious founder. The reconciliation of the conflicting claims was well expressed by Lord Derby: 'Respect the founder's object,' he said, 'but use your own discretion as to the means. If you do not do the first, you will have no new endowments; if you neglect the last, those which you have will be of no use.' However firmly fixed the present system at our great universities may be, still, as a matter of fact, 'nothing could be more alien to the whole purport of the original statutes than that the period of study should be limited by the undergraduate course, and that fellowships should then be given as prizes for past exertions or as subsidies for ordinary teaching' (*Essays on the Endowment of Research*, p. 58). 'With regard to the bulk of the college endowments,' says Mr. J. S. Cotton, 'the right mode of appropriation is perfectly clear. The intentions of the founders, the teaching of history, and the wants of the present day, all point in the same direction. The money should be devoted to study, and to study alone; enforced as a duty, and protected by adequate guarantees, but unencumbered by any obligation to impart common instruction. By this one bold and necessary reform the Universities of Oxford and Cambridge may once again pick up the torch of intellectual progress, which has for a while fallen from their hands; and at the same time England, in fulfilling the designs of her great patrons of learning, may regain her place among the nations as the chosen home of literary erudition and scientific inquiry' (p. 63). In other essays in the same volume the late Dr. C. E. Appleton inquires into the economical character of subsidies to education in all grades (pp. 64–85), and then examines the endowment of research as a productive form of expenditure. On the latter head he points out that 'the investigation of truth, considered as a vocation, is an instance of that class of industry whose economical condition seems to be one of inherent and permanent incapability to maintain itself,' and concludes that 'it is scarcely conceivable that any alteration, however radical, could be made in the arrangements of society which could render the labour of scientific discovery of any appreciable pecuniary value to the man engaged in it.' Consequently, in order to live, a 'researcher' must engage in some other occupation, which supports him and leaves him some spare time and energy for his special research. The alliance of research with incumbency of a benefice, while rendering research possible, cannot be serviceable for the cure of souls; neither can the research amount to what it might under conditions not hampered by the duties of the benefice. But the increased zeal of the Church is steadily driving other interests away from the incumbencies. A good school appointment, while less compromised by research, cannot but cumber the efforts of the researcher. 'It is a melancholy fact,' says Dr. Appleton, 'that the connection of the profession of learning and science with that of the higher education in this country, owing in large measure to the great improvements which have been made in the latter, and the engrossing character of the duties which it imposes, has gone far to choke the spirit of original investigation altogether' (p. 90). Again, however, there is the fact that scientific men get attached to commercial enterprise as advisers of large firms, or as themselves patentees. Still, 'with respect to the enormous proportion of scientifically trained persons who are directly or indirectly supported by commerce, it should be remarked that this source of maintenance is not only the exclusive privilege of physical science, but almost the exclusive privilege of *one only* of the physical sciences. There is no commercial career open to a biologist, for instance; and the existence of a commercial career, and frequently a very lucrative one, for the chemist, has the effect of starving all the other sciences for the benefit of one of them. One of our foremost teachers of biology complained to me not long ago that he was compelled to advise his best pupils, who were desirous of devoting themselves to a life of research, to

give up their own study and enter upon that of chemistry, as there was no prospect of a career for them in any other science' (p. 96). Besides this disturbance of the proportions of knowledge, another disadvantage, arising from being compelled to depend on commerce for support, is this, that the introduction of the utilitarian motive destroys the strictly scientific character of research. There remains the case in which the expenses of a life devoted to research are provided from the private fortune of the inquirer. This, says Dr. Appleton with bitter keenness, 'is a way of paying for research which is very characteristic of this country.' Yet, 'judged by its results, it would seem to be more advantageous to the cause of knowledge than any of the preceding expedients. Whilst in Germany the case of Humboldt is an exceptional one, it is a remarkable fact that some of the greatest scientific work, both as regards quality and quantity, has been carried out in England by men of property. The possessor of private fortune who engages in research is indeed more nearly in the position of the recipient of an endowment for research than any other, because he is entirely free from the distraction of extraneous duties. But the system of letting research be paid for in this way is not without grave disadvantages. In the first place, this kind of support is sporadic and fortuitous, and though favourable to the development of particular studies, it resembles the dependence of science upon commerce in this respect, that it is quite inconsistent with the harmonious development of the body of human knowledge as an organised and interdependent whole. Secondly, there is unfortunately no necessary connection between wisdom and the inheritance of riches, and consequently it is always within the bounds of possibility that a man of property may subsidise in his own person, not knowledge but error, a mischievous crotchet or a perfectly fruitless and impossible inquiry, and may employ the contents of a bottomless purse in compelling the attention of the world to it. This possibility, thirdly, is analogous to another disadvantage attending this mode of support. There is no guarantee in the case of the private person, as there is to some extent in the case of all the preceding expedients, and as may be secured by the proper administration of public endowment, that the investigator is sufficiently furnished with the preliminary knowledge or discipline to make his researches fruitful. In short, work supported by private means is very likely to be *amateur* work, or *duplicate* work. It may be added, finally, that from an economical point of view the employment of private wealth upon research stands on the same footing as endowment. If the object is unproductive the community at large is *in either case* poorer by all that is consumed by the investigator while employed in research' (pp. 97–99). The various artificial means by which scientific research has hitherto been supported being attended with grave disadvantages to science itself, the only means of maintaining knowledge which remains is that of public endowment. The endowment of scientific investigation out of the taxes—and Dr. Appleton rightly recognises that the commonly talked of opposition between the physical sciences and other branches of study is entirely without foundation—has been recommended on a variety of grounds: 'from considerations of the dignity of knowledge and the honour of a nation; from the examples of other nations who are under a paternal form of government; or as one of the functions and expenses of the sovereign. Bentham justifies it as a work of superfluity, the expense of which is trifling as compared to the mass of necessary contributions. Let any one, he says, undertake to restore to each his quota of this superfluous expense, and it would be found to be imperceptible, so as "to excite no distinct sensation which can give rise to a distinct complaint." Others, again, have held that the endowment of science involves considerations which do not come within the view of political economy, and therefore, if not sanctioned, that such endowment is a little condemned by it.' Dr. Appleton, however, faces the economical aspect of direct endowment and science, and concludes that 'the application of endowments to the maintenance of scientific research is economically sound, because, although knowledge is a kind of wealth, there are apparently insuperable difficulties in the way of making it an exchangeable commodity, out of the sale of which the scientific observer can make a living.' There might also be urged 'the beneficial effect which purely abstract ideas—such as, e.g., that of the universal brotherhood of mankind—have exercised indirectly on the produc-

tion of wealth, by bringing about changes in the relations of men and nations to one another.' The case of Tycho Brahe is certainly a remarkable example of the princely fashion in which the sixteenth century thought fit to endow research, and might shame a less material age into some attempt at imitation.

There can be no question that the examination system is in direct antithesis to original research. 'Competitive examinations and original research,' says Professor Sayce (p. 139), 'are incompatible terms. The object of the one is to *appear* wise, the object of the other to *be* so. The one is mercenary, the other unselfish; and however advisable it may be to drive a boy through a mental treadmill, the process must degrade a man into a piece of machinery.' No learning is reckoned of any account unless it will 'pay' in examinations. 'Professor Max Müller offered in vain, term after term, to read the *Rig-Veda* with any one of the 2,400 members of the University of Oxford; none would go to him, since a third-hand acquaintance with a few words and forms from that oldest specimen of Aryan literature is sufficient for the schools. The same professor, one of the most interesting and lucid of lecturers, when lecturing on the fascinating subject of comparative mythology, which he has made so peculiarly his own, could collect but a miserable fragment of an audience around him, and even of this the larger part consisted of college lecturers, who intended to retail to their own pupils some of the crumbs which had fallen into their note-books.' This is all very humiliating. Mr. Sayce goes on to sum up the mischievous results of the examination system 'at these "ancient seats of learning," though now of cram, under the general charge of its destruction of intellectual morality, and alienation of science and research.'

The testimony of Dr. Henry Clifton Sorby is very striking. 'Judging from my own experience,' he says (p. 151), 'I do not hesitate to say that for the successful prosecution of original inquiry, two of the most essential requisites are abundance of time for continuous and extended experiments, and freedom from all those disturbing cares and engagements which either interrupt the experiments at critical times, or so occupy the attention as to prevent the mind from properly digesting the results, and deducing from them all the conclusions to which they should conduct the investigator.' The same reasoning applies to all other subjects of scientific investigation, as well as to physical science. The examples Dr. Sorby cites from his own studies are remarkable, and he concludes emphatically that, 'whatever the experience of others may lead them to think, mine has been amply sufficient to convince me that I never could have done what I have been able to do if it had been necessary for me to attend to any business or profession as a means of support' (p. 163). One exception he makes—and it may be said to prove the rule—in the case of those who are employed to carry out what really are original inquiries in connection with some of our large manufactories. Such positions do indeed 'present great facilities for the advancement of certain branches of science—indeed, they may almost be called an endowment for research; but the care of a business and profession is a totally different thing.

Assuming that the money difficulty is overcome, there would still remain the further difficulty of obtaining the right young men as 'researchers,' and of regulating their appointment. Dr. Sorby has no doubt that such men could be found, 'and in fact I could name several noble examples of the very sort wanted.' Besides, 'looking at the question from a national point of view, one cannot but feel that to enable such men to occupy their whole time over the valuable work which they are both able and willing to do, is out of all proportion more important than rewarding a youth who has passed a successful examination in such a way that the public gains little or nothing from the expenditure.' As to the regulation of such appointments, Dr. Sorby has some very pointed remarks. 'Much of what has been urged against such endowments,' he argues, 'appears to me to have force not so much against the general principle as against what I regard as a wrong application of it. Some have urged that it would lead to no good result, because, when once such an appointment has been obtained, a person who had worked hard as a candidate would become idle as soon as the need for work ceased to exist. Precaution should be taken to avoid a conclusion so lame and impotent as this. Everything should be so regu-

lated that good and efficient men may not be driven back by the feeling of uncertain tenure, and at the same time that it may be impossible for a man, when once he has obtained an appointment, to pocket the money and do no more work. Unless such a thing were rendered impossible, there would be little advantage in changing the present system. The conclusion to which I have come is, that any one who has the will and ability for original work may very safely be appointed for a certain number of years, and after that reappointed every year, or every two years, as long as he continues to discharge his duties in an efficient manner. I do not think there would generally and in practice be any difficulty in deciding whether he did so. Though a great amount of excellent scientific work may produce a very small show, yet almost any one who had had practical experience of original research could easily see whether adequate work had been done, or time passed in laborious idleness. In the case of residents in a university I can scarcely believe a mistake to be possible.' Further, 'in making regulations for the endowment of research, care should be taken to avoid dictation, and to allow as much room as possible for the intellectual expansion of the individual.' As to the amount of annual income to be paid to a 'researcher' that would be most conducive to the general advancement of science, Dr. Sorby naturally finds it difficult to pronounce any very confident opinion, on account of the whole system having been so far almost untried. 'The character of the occupation and social position must be taken into account, as well as mere money value. This latter, however, should be sufficient to attract and permanently attach to the work of research men of the highest intellectual capacity, and enable them to enjoy those material advantages which they could obtain if they devoted their time and talents to any business or profession not necessarily involving a greater amount of personal discomfort.' Perhaps this estimate is highly liberal. The well-paid posts in universities at the present time do not encourage large stipends. The man of science should not be expected to enter on contests of social display; on the contrary, it will be all the better for himself and for science that he rather err on the other side.

Professor Max Müller (*Chips from a German Workshop*, vol. iv. pp. 4–10) makes a strong argument for reform at Oxford and Cambridge, which may be usefully applied to other endowed institutions as well, and which supports powerfully the views indicated in the foregoing portion of this article. 'Unless I am mistaken,' he says, 'there was really no university in which more ample provision had been made by founders and benefactors than at Oxford, for the support and encouragement of a class of students who should follow up new lines of study, devote their energies to work which, from its very nature, could not be lucrative or even self-supporting, and maintain the fame of English learning, English industry, and English genius in that great and time-honoured republic of learning which claims the allegiance of the whole of Europe—nay, of the whole civilised world. That work at Oxford and Cambridge was meant to be done by the Fellows of colleges.' Something has already been done, but 'something remains still to be done in order to restore these fellowships more fully and more efficiently to their original purpose, and thus to secure to the university not only a staff of zealous teachers, which it certainly possesses, but likewise a class of independent workers, of men who, by original research, by critical editions of the classics, by an acquisition of scholarlike knowledge of other languages besides Greek and Latin, by an honest devotion to one or the other among the numerous branches of physical science, by fearless researches into the ancient history of mankind, by a careful revision of the materials for the history of politics, jurisprudence, medicine, literature, and arts, by a life-long occupation with the problems of philosophy, and last, not least, by a real study of theology, or the science of religion, should perform again those duties which, in the stillness of the Middle Ages, were performed by learned friars within the walls of our colleges. . . If only twenty men in Oxford and Cambridge had the will, everything is ready for a reform—that is, for a restoration of the ancient glory of Oxford. The funds which are now frittered away in so-called prize fellowships would enable the universities to-morrow to invite the best talent of England back to its legitimate home. . . Why should not a fellowship be made

into a career for life, beginning with little but rising, like the incomes of other professions? Why should the grotesque condition of celibacy be imposed on a fellowship, instead of the really salutary condition of—No work, no pay? Why should not some special literary or scientific work be assigned to each Fellow, whether resident in Oxford or sent abroad on scientific missions? Why, instead of having fifty young men scattered about in England, should we not have ten of the best workers in every branch of human knowledge resident at Oxford, whether as teachers, or as guides, or as examples? The very presence of such men would have a stimulating and elevating effect; it would show to the young men higher objects of human ambition than the bâton of a field-marshal, the mitre of a bishop, the ermine of a judge, or the money-bags of a merchant; it would create for the future a supply of new workers as soon as there was for them, if not an avenue to wealth and power, at least a fair opening for hard work and proper pay. All this might be done to-morrow without any injury to anybody, and with every chance of producing results of the greatest value to the universities, to the country, and to the world at large. . . . Much of the work, therefore, which in other universities falls to the lot of the professors ought in Oxford to be performed by a staff of student Fellows, whose labours should be properly organised, as they are in the Institute of France or in the Academy of Berlin. With or without teaching, they could perform the work which no university can safely neglect, the work of constantly testing the soundness of our intellectual food, and of steadily expanding the realms of knowledge. We want pioneers, explorers, conquerors, and we could have them in abundance if we cared to have them. What other universities do by founding new chairs for new sciences, the colleges of Oxford could do to-morrow by applying the funds which are not required for teaching purposes, and which are now spent on sinecure fellowships, for making either temporary or permanent provision for the endowment of original research.'

It ought to be acknowledged that there are a few prizes at the universities which may be regarded as so many endowments of research; and certain others have been founded by London City Companies, notably the Grocers, Mercers, and Goldsmiths. (See *Essays on the Endowment of Research by various Writers* H. S. King & Co.)

Responsions. *See* MODERATIONS.

Results. *See* PAYMENT BY RESULTS.

Rewards.—The term reward in connection with education may be defined as something bestowed by one in authority in recognition of a good or virtuous act. The reward may have an intrinsic value, as in the case of school prizes, or may be coveted and prized merely as a mark or symbol of approval and commendation. Most rewards bestowed on the young owe a part of their value to the distinction and honour which they bring to the winner. From this definition it will be seen that it is the essence of a reward that it be given as a consequence and in acknowledgment of an effort of will. Hence a school-prize, position in honours' lists, and so forth, is only a reward so far as the attainment of it depends on effort, and not on superior ability. Rewards are correlated with punishments, constituting together the great means of stimulating the will to right action before the higher motives are sufficiently developed. A reward incites the will to effort by the prospect of a pleasure, whereas punishment stimulates it by the compulsory force of pain (cf. article PUNISHMENT). It is evident that in the apportioning of rewards regard must always be paid to the amount of effort involved. Hence it may often be desirable to reward backward children, the more so as they are shut out from the distinctions and prizes which depend on superior ability. Rewards, like punishments, may easily be given thoughtlessly and in excess, in which case they are likely to do harm rather than good. Giving things to young children for doing what they ought to do without such inducements, a fault common among weak and indulgent parents, is detrimental to moral character. It is peculiarly foolish to reward children for acts of kindness or benevolence, the very essence of which is disinterestedness. It should be the aim of the educator to dispense with tangible rewards as far as possible, to lead the child to set a higher value on the approval which the reward represents than on the object itself, and gradually to emancipate it from the sway of such artificial stimuli

by exercising it in the pursuit of virtue for its own sake. (*See* Locke, *Thoughts*, §§ 52, 53; Sully, *Teacher's Handbook*, p. 480 and following; and article 'Belohnung,' in Schmidt's *Encyclopädie*; cf. references to Beneke and Waitz at end of article PUNISHMENT.)

Reynolds, John. *See* HOME AND COLONIAL SCHOOL SOCIETY.

Rhetor. *See* ROMAN EDUCATION.

Rhetoric (from Greek ῥήτωρ, an orator) meant in ancient times the principles which underlie the art of oratory. It is now used in a more extended sense to denote the theory of eloquence, or the effective employment of language, whether spoken or written. The end of speech is either to convince the understanding, gratify the feelings, or rouse the will. We are moved to act, however, only in so far as our judgments are convinced and our feelings excited; hence there are but two main rhetorical ends, the intellectual or logical, and the emotional or æsthetic. The inquiry into the best means of attaining these, leads on the one hand to the consideration of the conditions of clear understanding, such as clearness of language and logical correctness of argument, and on the other hand to the treatment of the elements that make up impressiveness and beauty of style. Rhetoric seeks further to classify the different kinds of composition, and to consider the special rules which are applicable to each. These are commonly divided into three: 1. Description, which has to do with the objects and scenes of still life; 2. Narration, which aims at presenting a series of actions in their proper connection and dependence; and 3. Exposition, which seeks to set forth the general truths of science. From this brief sketch of the science of rhetoric the reader may see that it has a close bearing on the teacher's work. A study of the rhetorical principles of clear statement forms in connection with logical study a necessary preparation for all intellectual education; and the study of composition on its æsthetic or artistic side will be of service to the teacher in setting forth the beauties of our great writers, and in exercising the taste of the young in literary composition. It is evident, further, that the special principles of each of the three main varieties of composition have their value for the teacher. Thus the rules of good description, which is required in the teaching of all concrete subjects, as geography, history on its picturesque side, and descriptive science, are of special utility. The art of description means the most effective way of representing an object, scene, or incident, so as to help the hearer or reader to the utmost in the imaginative realisation of the same; and the teacher who has studied the rhetorical principles of the subject will be in a better position to describe clearly and vividly, so as to leave a lasting impression on the child's mind. Again, in history-teaching of the more advanced kind, a knowledge of the rules of clear orderly narration is necessary to the teacher's success. And, finally, in expounding scientific truths, a knowledge of the rhetorical principles bearing on the management of the proposition, the choice of examples and so forth, will be found to be of very great value. (*See* Bain, *English Composition and Rhetoric*, enlarged edition, 1887.)

Richter, Johann Paul Friedrich (generally known under the Gallicised form 'Jean Paul,' which he adopted), *b.* 1763, the year after the publication of Rousseau's *Émile*, at Wonsiedel, a town in the Fichtelgebirge to the north-east of Bavaria. Richter came of a race of pedagogues, both his grandfather and his father having been schoolmasters. Of his early life and education we have a voluminous but by no means clear account in the fragmentary autobiography. The general impression left upon us is that from his regular pastors and masters Richter learnt but little. He was a dreamy child, living in a self-created world of fancy, and devouring from his earliest years every book he could lay his hands on. Among them he notes as epoch-making volumes the *Dialogues of the Dead* and *Robinson Crusoe*. In 1781 he left the university of Leipzig, where he was studying theology, in order to gain his own livelihood and support his mother, now a widow and in destitute circumstances. Having failed in his first literary ventures, he was driven to teaching as a last resource, and for two years acted as private tutor to the brother of a rich friend, but he found the work uncongenial and irksome. His next experience as a teacher was a complete contrast to the first. In 1789 he started for himself a school in the small town of Schwarzenbach. His pupils numbered only seven, most of them the sons of friends, and varying in age from seven to fifteen.

What to most men with his genius would have been a repulsive drudgery was to Richter an inspiring task. To use his own metaphor, he was the planet Saturn with his seven satellites. The planet must, we fancy, have often appeared to his class a comet or an *ignis fatuus*, leading them a wild dance through earth, air, fire, and water. Of formal instruction there was little, but all his pupils loved their master, and he had from the first firmly grasped the fundamental principle of education, not to instil knowledge but to evoke faculty, to teach not to preach. It was during these five years that the materials were gathered and the ideas matured which were given to the world some five years later in *Levana*, when the author had 'graduated as a parent.' Jean Paul is the direct lineal descendant of Jean-Jacques, and the *Levana* is one of those winged seeds blown out of France which fell and germinated on German soil, though the differences between the two men and their works are at least as striking as their resemblances. Richter, like Rousseau, is a sentimentalist, and approaches the problem of education from the emotional rather than from the intellectual side. Both regard the child as a tender plant to be reared and nurtured, not as a lump of clay to be moulded on the schoolmaster's wheel. Both sympathise with the joyous freedom of childhood and preach deliverance from the hide-bound traditions of the schoolroom. But here the resemblance ends. Rousseau starts with certain aphorisms—the innate goodness of human nature, the corrupting influence of society—and deduces therefrom a complete system with the logical accuracy and neatness of a Frenchman. Richter is the most eccentric of writers and repudiates all attempts at systematic exposition. *Levana* is a mighty maze, and that without a plan, yet not without fixed ideas and principles. In fact, as the outcome of personal experience, it is a far safer guide to parents and masters than the *doctrinaire* theory of his master. At starting he joins issue with the main principles on which Émile's education is based. Rousseau's is a system of elaborate checks and safeguards, a negative education which could be fully realised only in a coffin. To educate by illusions and carefully-prepared accidents is both immoral and futile, for sooner or later the boy will discover the trickery. To reward and punish by physical consequences only (the doctrine that Herbert Spencer has revived) is to sacrifice the growing man for the sake of the adult. Life is too short and the consequences too grave. Moreover, the theory is not really in accordance with nature. The will of a superior is as much a fact of nature as that fire burns or water drowns, and a child must be made to recognise one fact no less than the other. Lastly, Rousseau's system treats the pupil as a solitary unit and would cut him off from all human intercourse except with his governor, who follows him like his shadow. Richter lays full stress on the cultivation of social sympathies, and has no belief, at least for boys, in a cloistered virtue. In conclusion, we may glance at a few of the salient features in Richter's own system. In his strictures on the 'classical parrots' and his vindication of the mother tongue as the chief subject-matter of instruction he is a true modern. In his insistence on religious teaching without forms or formulas, catechisms or church-going, he is the worthy follower of Lessing. In his philosophic analysis of play and the pedagogic importance that he attaches to games, music, and fairy stories, he is a forerunner of Froebel. Lastly, in the broad view that he takes of life as a whole, neither magnifying nor belittling the functions of the teacher, he deserves among educators, even more than among writers, his epithet of 'unique.' Of the *Levana* a useful condensation has been edited by Susan Wood, B.Sc. Among Richter's other writings bearing on education *Quintus Fixlein* and *Maria Wuz* (an exquisite idyl depicting the inner life of a village dominie) deserve mention. For his doctrines *see* G. Wirth's *Richter als Pädagog*.

Robes (Academic). *See* UNIVERSITY ROBES.

Roman Education.—From very early times Hellenic culture had exercised a powerful influence over Latium. This culture was twofold, and found expression in two systems of education, the characteristics of which were essentially different. In the order of time, the military education of Sparta, which included the religious discipline of savage scourgings borne with a ferocious fortitude, was the first to be assimilated amongst a people whose founders were traditionally the sucklings of a she-wolf and the foster-children of a herdsman. The full hu-

manity of the Athenian system, which aimed at a happy harmony between the training of the body and the development of the mind, was a later incorporation. At first it is probable that the education of the young Roman was confined to instruction in music and dancing, along with such elements of gymnastic training as fitted him, as occasion served or as patriotism demanded, for the practice of the craft of the soldier, the sportsman, and the husbandman. The bodily exercises of the Latin youth, whilst solid and substantial, were altogether alien from the idea of the artistic physical perfection which was the aim of Hellenic gymnastics. The prizes of competition in the public games, which, amongst the Greeks, were the prerogative of an ascertained free Hellenic descent, were not long, after the institution of like contests among the Romans, in being relegated to the hands of freedmen and foreigners, and even of persons who had no franchise at all except their painfully acquired skill as riders and boxers. Very early in the history of Rome, however, there was a general diffusion of elementary accomplishments. Even among the lower classes and the slaves there was a considerable knowledge of reading, writing, and counting; and slaves, who might be stewards and men of affairs, were profitably placed under instruction in several departments of scholarship. The first schools were not opened at Rome until a comparatively late period, not, indeed, according to Compayré, before the end of the third century B.C.; although Dionysius of Halicarnassus represents the abduction of Virginia, about 449 B.C., to have taken place as she was on her way, attended by her nurse, to her school—the schools, *διδασκαλεῖα*, of the day being grouped or distributed around the forum *περὶ τὴν ἀγοράν*. Until the institution of schools, the Romans had no teachers save their parents, and nature, and experience. And, indeed, there was never a stage in the history of Rome at which the tradition of parental duties and privileges in this respect was not kept up amongst the foremost and most illustrious personages in the State. Mothers distinguished themselves for their devotion to their children by acting directly as nurses. Cato the Censor personally taught his son to read, as well as to hurl the dart, to fence, to ride, to box, and to swim across the swift and eddying currents of the Tiber. This last accomplishment was thought so necessary as to be ranked with letters themselves as an item of education; and it was the common phrase to describe a worthless and ill-educated person, that he had learned neither to read nor to swim, *nec literas didicit nec natare*, which is, in fact, only the Latin equivalent for an antecedent Greek proverb. Suetonius tells us that Augustus himself chiefly instructed his grandchildren in reading, writing, swimming, and other rudimentary matters; and that he made a special point that they should imitate his handwriting. And Marcus Aurelius records, amongst the obligations he thankfully professes to the members of his family, how from his grandfather Verus he had learned good morals and the government of his temper; from the reputation and the remembrance of his father, Annius Verus, modesty and manliness of character; from his mother, Domitia Calvilla, named also Lucilla, piety and beneficence and abstinence, not only from evil deeds, but even from evil thoughts, in addition to simplicity in his manner of living, so far removed from the luxurious habits of the rich. Further, from his governor the same accomplished emperor learned to avoid partisanship in the games of the circus and in the contests of the gladiators; to endure labour with cheerfulness, to want little, to work with his own hands, to refrain from meddling with other people's affairs, and to be reluctant to listen to slander.

The parental and domestic system of education enjoyed a continued survival and a concurrency of observance with the flourishing existence of the public schools, after the latter had become a recognised institution in Rome. The conservatism and prudence of the Roman character were, however, prejudiced against them, especially on the score of their presumed tendency to the corruption of virtue, and their suggestions and opportunities of immorality. Marcus Aurelius was expressly grateful to his great-grandfather—perhaps his mother's grandfather, Catilius Severus—for having kept him from frequenting public schools, and for having supplied him with good teachers at home. Quintilian did not share the imperial distrust. In his judgment corruption was not a

thing of place, and home might be as vicious as the school. It was the disposition of the individual pupil, and the care taken of him, that made the whole difference. Public schools encouraged various qualities which could not be fostered by private education, as, for instance, friendship and emulation; and they offered incitements to effort, both to masters and pupils, which were otherwise unknown. The younger Pliny happily exemplifies his acquiescence in both methods of education. At the close of a letter recommending Julius Gruitor as a tutor for the son of his friend, Corellia Hispulla, he counsels that lady, under favour of the gods, to entrust the boy to a preceptor from whom he will learn morals first and afterwards eloquence, which, if morals are not taught with it, is learned to small advantage. In another letter he requests his correspondent, Cornelius Tacitus, to assist him in finding teachers of ability for what may be described as a proprietary school which he was generously engaged in founding at Como, for the benefit of the citizens who, in default of a school at their own doors, suffered the inconvenience of sending their sons to Milan for education.

In the regal and the remoter republican times of Rome, the father of a family was a king in his own house, with the right of life and death over all belonging to him. This paternal authority was unlimited, unassailable, inalienable. The sons grew up in reverence of their father, from whose authority even marriage and the establishment of families of their own did not emancipate them. The daughters were released from it by marriage, but only to come under a like authority as vested in the head of the family of the husband. Thus the entire Roman house was controlled by a single will; and the wife, children, and slaves, who together constituted the *familia*, were accustomed to unconditional obedience. Yet, withal, the position of the mother in the family, as compared with the slighter esteem in which women were held in Greece, was one of dignity and reverence. Relatively to the rest of the household the Roman wife enjoyed a derived authority almost co-ordinate with that of her husband, in whose frequent absences from home it devolved upon her to order and direct everything. The matron, whose very name still inspires respect, was the guardian of the family circle, and the educator of her children, to whom she frequently gave direct and personal instruction; as did, for instance, the noble Cornelia, whose sons, the Gracchi, she cherished as the choicest of her jewels.

Roman education was almost exclusively physical and moral, or, rather, military and religious. On the one hand, there were the gymnastic exercises in the Campus Martius, and, on the other, the learning of songs celebrating the heroic deeds of their ancestors, and the recitation of the Salian hymns—a sort of rhythmical catechism containing the names of the gods and goddesses, and celebrating particularly the praise of Mars, Juno, Venus, and Minerva. Besides this there was the study of the Laws of the Twelve Tables, which the youthful citizen committed to memory; and from his intimate acquaintance with which he was accustomed from infancy to consider the law as something natural, necessary, sacred, and inviolable. The Roman purpose in education was practical and utilitarian. Everything was calculated to enforce and to encourage a personal self-control, and self-denial, and self-forgetfulness, and self-sacrifice with regard to the commonweal. Men, the most robust, the most courageous, the best disciplined, and the most patriotic that ever lived, were the fruit of this natural education. Rome was the great school of the civic and military virtues. She was not speculative, and had little regard for ideals, she forebore to indulge in a disinterested pursuit of a perfect physical and intellectual development.

Her purpose was the training of soldiers and civilians in rigid obedience and to supreme devotion. She would have her sons practical, energetic, eloquent, tinged but not imbued with philosophy; trained to spare neither themselves nor others; reading and thinking only with an apology; best engaged defending a political principle, in maintaining with gravity and solemnity the conservation of ancient freedom, in leading armies through unexplored deserts, establishing roads, fortresses, settlements, as the results of conquest, or in ordering and superintending the slow, certain and utter annihilation of some enemy of her growth and greatness. She did not know man in the abstract; she knew only the Roman

citizen. The primitive state of manners, however, did not continue. In the course of the majestic march of the Republic, Rome became more and more amenable to Hellenic influence. As the horizon of culture widened, the subjects of study grew more numerous; and it became necessary or expedient that the mother, as the educator of her children, should call in the aid of substitutes or assistants from without. When the boy of the newer period, dating from about the close of the third century, B.C., at which time a novel taste for letters and arts had already begun to transform the austerity and rudeness of the primitive era, had outgrown the nursery, he was placed in charge of an attendant, usually a slave, chosen for his good character and steadiness, who was often his tutor also, and who, in the latter capacity, was entrusted with the moral and intellectual education of his charge. As the knowledge of Greek prevailed among Romans of the upper classes, a Greek was usually selected for this office; and, as being adopted from Greece, was called, as in Greece, a pedagogue. Originally the *Pædagogus* was held in high honour, but the person and the office became degraded through the culpable indifference of the Roman fathers. 'It is a course never enough to be ridiculed,' says Plutarch, 'which most men nowadays take in this affair, who, if any of their servants be better than the rest, dispose some of them to follow husbandry, some to navigation, some to merchandise, some to be stewards in their houses, and some, lastly, to put out their money to use for them. But if they find any slave that is a drunkard or a glutton, and unfit for any other business, to him they assign the government of their children; whereas a good pedagogue ought to be such a one in his disposition as Phœnix, tutor to Achilles, was.'

The schools were commonly private establishments, the masters of which stood in no very high repute, and, characteristically severe, were largely typified by the *plagosus Orbilius* of Horace; who, as well as Martial and others, gives here and there vivid and realistic touches of schoolboy life. At the age of seven the child was committed to the *literator*, who taught reading, by the syllabic method; writing by allowing the pupil to follow the coarse of a copy inscribed on a waxen tablet; and reckoning, which was taught by movements and combinations of the fingers, with an alternative resort to the *abacus*, or counting-frame. Arithmetic, indeed, on account of its usefulness, was more esteemed by the Romans than by the Greeks; although at no time did the former distinguish themselves in the mathematical and mechanical sciences.

'This preliminary training,' says Mr. Oscar Browning, 'lasted from the seventh to the twelfth year. The children were then handed over to the *grammaticus* or *literatus*. The study of Greek was now added to that of Latin, etymology was taught, probably a very false one, and the rules of Syntax and composition. The explanation of the poets was used for the formation of moral principle—Livius Andronicus in Latin, the Odyssey of Homer in Greek. Virgil, Cicero, and Æsop were studied in those days as in our own. Orthography and grammar were carefully inculcated; whole poems and orations were learnt by heart. Nor was history neglected. Atticus, the friend of Cicero, was so well acquainted with Roman history, that he knew the laws, the treaties, and the momentous events which formed the fabric of his country's annals. The storied past filled him with traditions of the inheritance of duty of each noble stock. The first steps were made towards the practice of eloquence. As the *literator* had prepared the way for the *grammaticus*, so the *grammaticus* smoothed the path for the *rhetor*. At the age of fifteen or sixteen the young Roman assumed the dress of manhood. He was no longer treated as a child and kept in strict discipline with stripes. He now chose his profession, either the life of a country gentleman devoted to the patriotic duty of agriculture, or the army, or the senate, or the forum, or that complex of pursuits to which the noble Roman was called by virtue of his birth.'

There were many persons of the better class, as has been already indicated, who 'did not care to send their children to the public schools, where the morals,' as Falke roundly puts it, 'were far from good, the situation often unhealthy, and the building ill-ventilated, though not unfrequently the instruction, such as it was, was given on the roof, or even in the public street. The masters, despised and poorly paid, freedmen or provincials, were morose and

brutal, and all discipline was enforced by the rod. Thus many persons preferred to have the teacher give his lessons at the house, while some, like Æmilius Paulus, the conqueror of Macedonia, kept a Greek tutor in the family.'

Augustus engaged for his grandchildren, at a fixed salary, the best teacher that Rome had, Verrius Flaccus; who only accepted the position under the condition that he should be allowed to retain all his pupils, with whom the imperial princes were taught in common. Indeed, the emperors generally were not negligent in this respect. Agrippina chose the celebrated Seneca as tutor for the young Nero; Domitian, Quintilian for his sister's grandchildren; and Antoninus Pius, the Stoic Apollonius for the young Marcus Aurelius. This haughty scholar, however, refused to enter the imperial palace; the pupils must come to him: and so Marcus Aurelius, the successor to the throne, went daily, like any other boy, to his master's house. At a later day Fronto became Marcus's teacher and friend. 'Under these masters the boy learned the proper use and pronunciation of his mother-tongue; he learned Greek, read the classic authors of both languages, the poets especially, much of whose works he learned by heart; and practised elocution, an art of prime necessity for any one who proposed to enter the public service. Greek and Roman oratory was the only branch of learning for which the State ever provided instructors; and this was done under the empire.' Forensic education held a position of gradually increasing importance, and at last absorbed into itself the whole of Roman instruction. Rhetoric was to Roman education what music was to Greek. The word rhetoric so used, however, must be understood as intended to include almost every branch of intellectual activity, and almost every development of moral excellence. With Quintilian, Cicero, Seneca, and other apologists of oratory, it passed as a truism that 'the perfect orator cannot exist, unless as a good man; and we require in him, therefore, not only consummate ability in speaking, but every excellence of mind.' It is thus in keeping with the utilitarian and imperious disposition of the typical Roman, that all the gifts and graces, all the amenities, accomplishments, subtleties, and faculties of the mind should converge and culminate in the exquisite creation of a science and an art, the practical use of which was to convince in order to command, to persuade so as to rule.

The Republic had shown little concern for the men whose business it was to care for the mind and the body. On this point, as on so many others, the Empire inaugurated a new policy. By his decree in favour of physicians and the professors of the liberal arts, Cæsar elevated their social position and paved their way to wealth. The honour is due to Vespasian of having created, at the expense of the State, higher literary teaching, by bestowing on some Greek and Latin rhetoricians a salary of 100,000 sesterces from the imperial treasury. Quintilian was the first to profit by this payment; and an expression of his makes it probable that at the end of twenty years three public professors obtained a retiring pension. Hadrian and his two successors increased the number of chairs supported by the State; and various cities throughout the empire followed their example.

The Romans produced little in the way of systematic pedagogy. Cato, the Censor, prepared manuals, or, perhaps, a single manual in several parts, for the instruction of youth – a sort of cyclopædia, indeed, which was little more than an embodiment of the old Roman household knowledge. One thing, at least, as illustrating Cato's principles and practice with regard to the moral training, deserves in this connection a formal statement of the admiration which in all subsequent ages it has abundantly received. Cato was as careful, says Plutarch, not to use an unbecoming expression before his son as if he were in the presence of a vestal virgin—so respectable a precedent had Juvenal for the celebrated passage which occurs in his fourteenth Satire :—

> Maxima debetur puero reverentia. Si quid
> Turpe paras, ne tu pueri contemseris annos:
> Sed peccaturo obstet tibi filius infans.

The progress of Roman culture is distinctly shown by a comparison of the curriculum of Cato with that of Marcus Terentius Varro, whom Quintilian calls the most learned of the Romans. For, whilst Cato thought that a 'proper man' ought to study oratory, medicine, husbandry, war, and law, and was at liberty to look into Greek literature a little that

he might cull from the mass of chaff and rubbish, as he affected to deem it, some serviceable maxims of practical experience, though he might not study it thoroughly, Varro extended the limit of allowed and fitting studies to grammar, logic, rhetoric, geometry, arithmetic, astronomy, music, medicine, and architecture. As the aggregate result of the later Roman education as expounded, advocated, and advanced by the life, labours, and literary works of Varro and his sympathisers, Professor Mommsen aptly says that 'there sprang up the new idea of *humanity*, as it is called, which consisted partly of a more or less superficial appropriation of the æsthetic culture of the Hellenes, partly of a privileged Stoic culture as an imitation or mutilated copy of the Greek. This new humanity, as the very name indicates, renounced the specific peculiarities of Roman life, nay, even came forward in opposition to them, and combined in itself, just like our closely kindred *general culture*, a nationally cosmopolitan and socially exclusive character. Here, too, we trace the revolution which separated classes and levelled nations.'

Roscellinus. *See* SCHOLASTICISM.

Rousseau.—Jean-Jacques Rousseau (1712–1778) was born at Geneva, his mother dying in giving him birth, thus making his birth, as he pathetically said, the first misfortune of his life. Of weak body and morbid mind, his destiny was for himself gloomy and filled with pain, but he stands out for ever in history as one of those brilliant spirits of the eighteenth century who made the French Revolution possible, and in the 'azure of the past' he is one of that constellation in which the other stars of first magnitude are Voltaire and Diderot, d'Holbach and d'Alembert. His *Contrat Social* may be said to have been the very bible of the Revolutionists, with its passionate throb of liberty, its appeal to right and to justice. The 'gospel of Jean-Jacques Rousseau'—which rang over France, stirring the sleeping people as with a trumpet-blast and breathing into their hearts the longings which burst into the flame and the whirlwind of the Revolution when he himself lay sleeping for ever in the peaceful shades of Ermenonville—this gospel was, in a word, the cry that 'man is born free, but is in fetters everywhere.' 'To renounce liberty is to renounce manhood; it is to renounce the rights of humanity; yes, it is to renounce its duties.' Never book had mightier force than this *Contrat Social*, and though to-day its truths have become truisms and its mistakes absurdities, it yet remains as a monument to the man who grasped and held to a fundamental verity which had scarce been dreamed by his contemporaries.

In 1750 Rousseau made his *début* in the world of letters with an essay, which won a prize offered by the Academy of Dijon, on the question, 'Has the restoration of the sciences contributed to the purification or to the corruption of manners?' In this essay he endeavoured to prove the thesis that riches gave birth to luxury and idleness, and that the arts sprang from luxury, the sciences from idleness. Hence he argued that a return to simplicity of life would conduce to purity of morals. Out of this opinion grew his theory of education, a theory fully expounded in his famous *Émile*, published in 1762: a work which, he said in his preface, was 'commenced to please a good mother who was capable of thought,' and which was based on the idea that education should 'commence at birth,' and should be guided by a comprehension of child-nature growing out of a careful and sympathetic study thereof. In the very first sentence of his book Rousseau strikes the key-note in which all his writing is set: 'All is good as it comes from the hand of the Creator; all degenerates in the hands of man.' The object of education, then, is to follow the indications given by nature, and since 'men are moulded by education as plants by culture,' it is of vital importance that this education shall be sound. 'We are born feeble and have need of strength; we are born stripped of everything and we need help; we are born stupid and have need of judgment. Everything which we lack at birth, and which we require in our maturity, is given to us by education. This education comes from nature, from men, or from circumstances. The internal development of our faculties and of our organs is the education of nature; the use which we are taught to make of this development is the education of men; and the acquisition of experience about the things which affect us is the education of circumstances.' Of these three kinds of education that only which is given by men is really under our control.

Primarily the pupil is to be trained to be a *man*. 'How to live is the trade I would teach him. In passing from my hands he shall not be magistrate, or soldier, or priest; he shall be first of all *man*.' To this end education must begin in the cradle; the mother must nurse her babe that she may stand first in his affections; the father must be his first tutor; if the mother is too delicate to nurse, the father too busy to teach, the family has no real existence. As soon as the child begins to observe, care must be exercised in the objects he sees; he must be accustomed to the sight of new things, of ugly animals, that he may feel fear of nothing. As children are easily frightened by masks, Emile is first to see a pleasant-looking mask, and then the mask is put on by somebody and everybody laughs, so that the child laughs too; gradually ugly ones are introduced until, 'if I have managed my gradation well,' he will laugh at a hideous one as at the first. Thus a child may be made intrepid, and 'when reason begins to frighten them let habit reassure them.' As Emile begins to speak and to walk no over-solicitude is to be shown. If he hurts himself, tranquillity on the part of the elder teaches self-control and courage; and as a child, unless carelessly placed in danger, cannot hurt himself seriously, he should be left to face small injuries and so learn endurance. Thus nature teaches, and thus the child should be trained. He should not obtain a thing because he asks for it, but because he needs it; he should not act from obedience, but from necessity. Do not forbid him to do a thing, but prevent him from doing it; let that which is granted be granted at his first request, and let a refusal be irrevocable. Thus he will become patient, equable, peaceable, for it is in man's nature to endure the necessity of things, but not the whims of other people. Let the child be free to follow his own fancies, putting out of his way valuable things that he might injure, and let him be left to grow without chastisement and without forcing. In similar fashion is his education to progress as he grows older; experience is to be allowed to teach him lessons, and control is to be minimised as much as possible. His body is to be trained, but no direct instruction is to be given to his mind until he passes out of actual childhood. Then let him learn his first geography in the town he inhabits; stimulate his curiosity by expressing wonder as to the occurrence of natural phenomena; answer when he asks, and thus lead him to knowledge. Gradually, carefully prepared experiments give rise to new curiosity, again to be satisfied; and so step by step his education progresses, always naturally, and therefore always surely.

Such is an outline of the famous educational scheme of Rousseau, a work which may still well be studied by those who have in their hands the guidance of the young. Rousseau died on July 2, 1778, and was buried in the Isle of Poplars, Ermenonville; his tomb bears the inscription: 'Here lies the man of nature and of truth. *Vitam impendere vero*.'

Royal Commissions on Education are appointed by the Queen in council. They consist of a certain number of persons, members of either or both Houses of Parliament, with whom are associated individuals possessing a special knowledge of education, or in a special sense representing educational interests secular or sectarian. They are charged with the duty of reporting in terms of their 'order of reference.' They have ample power to examine witnesses, and to call for the production of all documents which they deem necessary for their inquiry. The evidence which they collect, and the report which is founded on it, are published in a Blue-Book, which is presented to members of both Houses of Parliament, and may be bought by any one from the 'Queen's Printers' (Messrs. Eyre & Spottiswoode, New-Street Square, E.C., or Messrs. Stanford, Charing Cross) for a small sum, charged to cover the cost of printing and publication. Reports, old and new, and odd volumes of reports can also be obtained from Messrs. P. King & Co., Canada Buildings, Westminster, S.W., Parliamentary publishers and book sellers. The report of a Royal Commission should be signed by all the members of the commission. If unanimity has not prevailed, it is signed by the majority, and appended to it is published the report of the dissentient minority or minorities. Reports on education have also been drawn up by Select Committees of the House of Commons, and both kinds of reports are usually made the bases of legislative and administrative reform. It will be found, for example, that before the first great exhaustive inquiry by a Royal Commission into the state of public instruction in Eng-

land was ordered in 1858, several Committees of the House of Commons had investigated and reported upon education, e.g. Brougham's Committees of 1816 and 1818, and the Select Committees of 1834 and 1838. The first important Royal Commission on education was, however, that appointed by Lord John Russell's Administration in 1850 to inquire into the state of the Universities of Oxford, Cambridge, and Dublin. The report of this Commission led to the legislation of 1854, by which the old University system was revolutionised and brought into harmony with modern requirements. (*See* article UNIVERSITY REFORM.) The famous 'Newcastle Commission' of 1858 was a Royal Commission, and consisted of the Duke of Newcastle, who was chairman, Sir John Duke Coleridge, now Lord Coleridge and Lord Chief Justice of England, the Rev. W. C. Lake, now Dean of Durham, Professor Goldwin Smith, Mr. Nassau Senior, Mr. Edward Miall, and the Rev. William Rogers. Mr. Fitzjames (now Mr. Justice) Stephen was the secretary. The Commission was helped by several assistant commissioners, who conducted special inquiries into the state of education in representative agricultural, manufacturing, mining, and fishing communities, not only in England, but in foreign countries. By its 'order of reference' the Newcastle Commission was charged with the duty of inquiring into 'the state of popular education in England, and the measures required for the extension of sound and cheap elementary instruction to all classes of the people.' Its chief recommendations were (1) that grants for elementary education should be expressly apportioned upon the examination of individual children; (2) that means should be taken for reaching more rapidly the places not previously aided with Parliamentary grants; (3) that the administration of the grants in aid should be simplified not merely as regards the clerical work of officials, but also by 'withdrawing Her Majesty's Government from direct financial interference between the managers and teachers of schools.' Thus the Report of the Newcastle Commission was the parent of (1) the 'Revised Code'; (2) 'payment by results'; and (3) the great reforms which were ultimately embodied in Mr. Forster's Act of 1870, and in the subsequent Acts, into the working of which another Royal Commission was appointed to inquire in January 1886.

On July 18, 1861, a celebrated Royal Commission was appointed to inquire into the condition of 'certain public schools in England.' The schools were Eton, Winchester, Westminster, Charterhouse, St. Paul's, Merchant Taylors', Harrow, Rugby, and Shrewsbury. The members of the Commission were the Earl of Clarendon, the Earl of Devon, Lord Lyttleton, Sir Stafford Northcote, the Hon. E. T. B. Twistleton, the Rev. W. H. Thompson, M.A., and Mr. Halford Vaughan, M.A. They were ordered to inquire into the administration of the school revenues, the condition of the foundations and endowments, the course of studies pursued, and the methods of teaching adopted. Professor Montague Bernard, B.C.L., was the secretary of the Commission. The Commissioners obtained at the outset written answers to questions addressed to the governing bodies and head-masters of the schools scheduled. Then they personally visited each school and inspected its arrangements. Finally they took evidence from a vast array of witnesses—including even some junior boys—who could presumably throw light on the subject. Though Marlborough, Cheltenham, Wellington College, and the City of London School were not included in the order of reference, the Commissioners, finding that these seminaries had attained a position entitling them to be ranked with the great public schools, also investigated their system of teaching from information voluntarily supplied, and reported on it. The Commissioners recommended that great modifications be made in the constitution of governing bodies of the great public schools—chiefly with the object of giving them permanence and stability of character, and of protecting them from the domination of local and personal influences. They suggested the appointment of some Crown nominees to each governing body. They recommended that governing bodies have power to amend their statutes, subject to the sanction of the Crown, to appoint and dismiss the head-master, who was to have the sole right of selecting his assistants. The Commissioners reported in favour of adding at least one modern language, French or German, and one branch of natural science, to the classical curriculum then in vogue. Every boy, it was recom-

mended, should be subjected to an entrance examination, designed to test his knowledge of classics and of French or German, and boys who failed to make reasonable progress were to be liable to dismissal. The Commissioners thought that charges and fees should be revised—the charge for instruction being in all cases separated from the charge for boarding and for domestic superintendence. The working of the monitorial system, according to the Commissioners, needed immediate vigilance, as did the system of fagging. They recommended that fags should be released from all work that ought to be done by domestic servants, and that fagging must never be allowed to encroach on a boy's time for lessons or for needful recreation. Holidays too ought, in the opinion of the Commissioners, to be arranged so that they should occur at the same time in each school. As to the existing system, the Commissioners reported that the course of study lacked flexibility and breadth, that the schools were 'too indulgent to idleness,' or struggled ineffectually with it, and as a result that they turned 'out a large proportion of men of idle habits and empty and uncultivated minds.' At the same time it was admitted that the schools had been for many years progressing in the right direction. The manners of the boys had improved, and the masters had maintained classical studies as the staple of an English education, 'a service,' said the Commissioners, which far outweighed the error of having clung to these studies too exclusively. The report was dated February 13, 1864. Mr. Vaughan dissented from the recommendation that a modern language should be one of the subjects included in the entrance examinations. (See *Parl. Papers*, 1864 [3288], vol. xi. p. 1.)

On December 28, 1864, a Royal Commission was appointed to inquire into the education given in schools not touched by the Newcastle Commission of 1858, or by the Public Schools Inquiry Commission, of which Lord Clarendon was chairman, in 1861. The scope of this inquiry included all schools which educate children excluded from the operation of the Parliamentary grant, except the nine great public schools already reported on by the Public Schools Inquiry Commission of 1861. The Commissioners were Lord Taunton (chairman), Lord Stanley, Lord Lyttleton, Dr. Hook, Dean of Chichester, Dr. Temple, now Bishop of London, Rev. A. T. Thorold, M.A., Mr. T. Dyke Acland, Mr. Edward Baines, Mr. W. E. Forster, Mr. Peter Erle, Q.C., and Dr. John Storrar. The Commissioners divided the schools they examined into (1) Endowed, (2) Private, and (3) Proprietary. By *Endowed Schools* they meant schools maintained wholly or partly by means of a permanent charitable endowment. The term *Private Schools* they limited to such as were the property of the head-master or head-mistress. The remaining schools, which were either the property of individuals or corporations, who in some cases appropriated the profits of them, and in others applied these to the reduction of the cost of their own children's education, the Commissioners described as *Proprietary Schools*. The investigations into the condition of the endowments of these schools and into the education of girls, a matter steadily kept in view by the Commissioners, rendered the inquiry specially interesting. Assistant Commissioners made reports on selected districts. Mr. D. R. Fearon, H.M. Inspector of Schools, reported on the metropolitan area; Mr. H. A. Giffard, M.A., on London outside the postal district; Mr. C. H. Stanton on Devon and Somerset; Mr. T. H. Green, M.A., Fellow of Balliol College, Oxford, on Staffordshire and Warwickshire; Mr. J. Hammond on East Anglia; Mr. Fitch, H.M. Inspector of Schools, on the West Riding of Yorkshire; Mr. James Bryce, afterwards Under-Secretary of State for Foreign Affairs, on Lancashire; and Mr. H. M. Bompas, M.A., on Wales. Mr. Matthew Arnold reported on the system of education existing in France, Germany, Switzerland, and Italy. The Rev. James Fraser, afterwards Bishop of Manchester, reported on the schools of the United States and Canada. Baron Mackay, of the Hague, at one time an *attaché* to the Dutch Legation in London, reported on the schools of Holland. At the instance of Dr. (now Sir) Lyon Playfair, who addressed a strong letter on the subject to the Commissioners, they also made inquiry into his assertion that the Industrial Exhibition at Paris in 1860 furnished evidence of a decline in the superiority of certain branches of English manufacture over those of other nations—a decline that was due in Dr. Playfair's opinion to the

absence of technical education in England. In fact, the whole modern movement in favour of technical education in Great Britain may be said to have originated with Dr. Playfair's letter and the Report of Lord Taunton's Commission upon it. The Commissioners reported that reform must begin with the endowed schools, because unless they were compelled to do good work they did positive harm by standing in the way of better institutions. Whilst regard was to be paid to the wishes of those who had originally bequeathed the endowments, the Commissioners advised that this sentiment ought not to be carried too far, for many of the bad existing arrangements were themselves departures from the intentions of the 'pious founder.' Rules, said the Commissioners, should be remodelled to suit the purpose of each school. Special constitutions of governing bodies should be discarded where they did not work well. The narrow curriculum of education should be enlarged. Gratuitous instruction should not be given indiscriminately where it was found to be lowering the character of the school, and with its character the standard of its teaching. Gratuitous instruction given at haphazard, and not as a reward of merit, actually defeated the intentions of the founders. It did not supply opportunities for poor children of exceptional talent, and it gradually prevented the school from giving high education. Three grades of schools, according to the Commissioners, should be organised: (1) schools which taught boys up to the age of 18 or 19; (2) schools which stopped their teaching at the age of 16, (3) schools which stopped it at the age of 14. In the first grade Greek was admissible in the classical course. In the second it was recommended that Greek be left out, and attention paid to two, and in the third to one modern language, in addition to Latin. The schools should be reorganised on a harmonious plan, so that those in a district or county might be made to supply each other's deficiencies. Limits should be set to the fees, and trustees should not be chosen exclusively from members of the Church of England. The restriction of masterships to persons in holy orders, it was reported, should be abolished, and with it the rule which assumed that all religious teaching must be that of the Anglican Church. As for endowments, their application, the Commissioners said, must be regulated by Parliament. All close foundations, whether in favour of the rich or the poor, were stigmatised by the Commission as evils. The fixed salaries and freehold tenure of masters the Commission thought should be done away with, the plan they favoured being payment by capitation fees, under a guarantee for a time that such payment would never fall under a certain annual sum. Exhibitions, said the Commissioners, should not be confined to the universities, but holders of them ought to be allowed to proceed to technical schools. The same recommendations in the main were made for girls' schools, and it was recommended that they should, in every case where it was possible, be allowed a share of all redistributed or available endowments. The establishment of boarding-houses on the 'hostel' or college system rather than on that of separate houses was also recommended, the plan having worked well at Marlborough, Haileybury, Wellington, and Felstead. On the whole, the Commission did not approve of the establishment of a normal school to train the masters. Masters so trained in France they had discovered became mere teachers rather than educators. Strong powers were recommended to be given to head-masters over their subordinates, and it was pointed out that a universal demand for a good system of official inspection existed. Small endowments, which just because they were small were wasted, the Commissioners suggested should be consolidated. Among the powers to be given to the governors were those of settling the programme of instruction and of preparing reorganisation schemes to be laid before the Charity Commissioners and Parliament for their sanction. Three authorities, it was suggested, should be constituted: governors for the local management of each school, a provincial authority to regulate the relations of schools in each district one to another, a central authority to exercise a general control over the working of the system. By enlarging the powers of the Charity Commission a central authority might be found. The Charity Commission, it was said, should appoint for each provincial district an official Commissioner for secondary education, with whom six or eight unpaid Commissioners should be associated as the provincial authority. On the other

hand, it was to be left to a district, if it chose, to form a representative board out of chairmen of boards of guardians and Crown nominees as a provincial authority. As for the governing bodies, it was pointed out that they were inefficient for many reasons, among others that they were chosen by co-optation. The new governing bodies, it was recommended, should consist of a small number of the existing trustees, to which were added trustees elected by the ratepayers and nominated by the provincial board. The schools, it was recommended, should be worked in close concert with the universities by means of a council of examinations. As for private and proprietary schools, it was pointed out that if they were to be effective their fees must not put them out of the reach of the class for whom the corresponding public schools were needed, and they must be registered and subjected to the same conditions of examination and inspection as the public schools. The report is to be found in *Parl. Papers*, 1867–1868 [3966], vol. xxviii. pt. i. 1. The Commissioners, whilst reporting generally that the answers of experts to their questions as to technical education shewed that it would be desirable to promote the teaching of physical science in secondary schools, did not present any elaborate report on the question. (See *Parl. Papers*, 1867 [3898], vol. xxvi. 261.)

In 1881, a Royal Commission, consisting of Mr. (now Sir) Bernhard Samuelson, F.R.S., Professor (now Sir) Henry Roscoe, F.R.S., Mr. (now Sir) Philip Magnus, Messrs. John Slagg, M.P., Swire Smith, and William Woodall, M.P., was appointed to inquire into the instruction of the industrial classes of certain foreign countries in technical and other subjects, and generally into the subject of technical education at home and abroad. Their first report is dated February 17, 1882, and deals with technical education in France. The Commissioners spoke with approval of the instruction in the use of tools, which had just been introduced into French elementary schools, but seemed in doubt as to the value of the new apprenticeship schools for training ordinary workmen, such as those which had been established at La Villette and Havre. Till this manual teaching was introduced into the French schools, the Commissioners reported that the French workmen got as little technical education as Englishmen. The gratuitous courses of lectures given in French towns on scientific and literary subjects the Commissioners thought highly valuable. They spoke with approval of the excellence of the gratuitous Art teaching given at an early age to children, and continued in adult schools, as beneficial to the French workman. In this report they made no practical recommendation, except the introduction of manual work into elementary schools frequented by children of the industrial class (*Parl. Papers*, 1882 [c. 3171], vol. xxvii. 40). The second and final report is dated April 4, 1884, and it stated that foreign industry, as tested by the Paris Exhibition of 1878, had revealed an unexpected capacity for development. In the production of some kinds of machinery France, Switzerland, and Germany were abreast of England. In industries involving chemical processes Germany was ahead of her. This was also the case with respect to the construction of roofs and buildings where accurate mathematical knowledge had to be applied. The soft woollen fabrics of Rheims and Roubaix excelled those of Bradford, especially in dyeing. Verviers exported to Scotland woollen yarns carded and spun by English machines from South American wool, at one time bought in Liverpool and London, but now purchasable in Antwerp. Great, however, as the progress of continental industry had been since 1850, the Commissioners reported that on the whole the English people still held their place at the head of the industrial world. They had not lost it: they were only losing it. The advantages gained by their continental rivals were due chiefly to the superiority of foreign manufacturers, their managers and their foremen, in technical skill, and in their sound knowledge of the sciences upon which their trades depended. The technical education given to the workmen also told on the competition between foreign and English industries. The Commissioners therefore recommended that action should be taken to promote technical education in the United Kingdom by the Legislature and public authorities. They suggested that in every trade where a knowledge of science or art is of advantage, it be made a condition of employment imposed on young persons by masters and trades unions that they shall take steps to get that knowledge—either in schools attached to works or groups of works, or

in such classes as may be available, these classes to be partly maintained by the employers and trade organisations. Promoters of technical classes were urged to make the emoluments of the teachers sufficient to tempt them to continue the instruction of their pupils beyond the rudimentary stage, and group the teaching of science subjects in accordance with the regulations of the Science and Art Department. It was recommended that technical scholarships be founded in elementary schools, and that agricultural societies promote and encourage classes in second ary or county schools for teaching agriculture. (*Parl. Papers*, 1884 [c. 3981], vol. xxix. p. 539.) The Commissioners further recommended the introduction of drawing as a necessary subject like the 'three R's' in elementary schools; the encouragement by grants, as for a 'specific subject,' of skill in using tools for working wood or iron in elementary schools; that object lessons in agriculture in all rural schools be given; that the Scotch rule that children under the age of fourteen shall not be allowed to work full time till they pass the Fifth Standard be extended to England; that School Boards have power to organise technical classes under the Science and Art Department, which should be empowered to arrange that the scientific teaching shall be better adapted to the wants of the working classes than it is at present; that it shall not be a requirement of the Department that fees be exacted from artisans under technical instruction; that in awards for industrial design more attention be paid by the Department than is the case at present, to the applicability of the design to the material it is to be wrought out in; that training colleges for elementary teachers desirous of imparting technical education be established; that local authorities be empowered to organise and maintain higher technical schools and colleges; that museums and libraries be opened on Sundays, and that the limit imposed by the Free Libraries Act on the expense which local authorities may incur for the establishment of museums and galleries of art be abolished. They also recommended the abolition of the maximum of 500*l.* as the grant which the Science and Art Department may make in aid of the erection of local schools of art and of museums in connection with them. (See *Technical Education*, by F. C. Montague, M.A.; Cassell & Co. (1887).)

In January 1886 a Royal Commission was appointed to inquire into the working of the Elementary Education Acts of England and Wales. The Commissioners were Lord Cross, chairman, Cardinal Manning, the Duke of Norfolk, Lord Harrowby, Lord Beauchamp, the Bishop of London, Lord Norton, Sir Francis Sandford, Mr. Lyulph Stanley, Sir John Lubbock, Sir Bernhard Samuelson, Rev. Dr. Rigg, Dr. Dale, Canon Gregory, Canon Smith, Rev. T. D. C. Morse, Mr. C. H. Alderson, Dr. J. G. Talbot, Mr. Sidney Buxton, Mr. T. E. Heller, Mr. Rathbone, Mr. Henry Richard, and Mr. George Shipton. Mr. Mundella and Mr. B. Molloy, M.P., were also members. Mr. Mundella retired on joining Mr. Gladstone's third Administration. Mr. Molloy resigned because Lord Salisbury's Government refused to grant a Select Committee to investigate charges of complicity with assassination brought against him and several Irish members by the *Times*, and which were reproduced in the House of Commons by Lord Hartington. The constitution of the Commission of 1886 differs from that of the Newcastle Commission in one important point. The Newcastle Commission was a body representing the general public interest in education. The Commission of 1886, on the other hand, represents special education interests, professional and sectarian. The points which the Commissioners were requested to inquire into were:

1. The existing law—how it grew up: (*a*) the law previous to 1870; (*b*) the Acts from 1870 to 1880; (*c*) the codes and instructions after 1870. 2. The existing state of facts—as to (*a*) buildings; (*b*) number of scholars; (*c*) income and expenditure; (*d*) staff and salaries; (*e*) comparison of Voluntary and Board schools; (*f*) merit grants; (*g*) small schools; (*h*) training colleges; (*k*) average duration of school life. 3. The provision made—(*a*) for the supply of schools; (*b*) for the management of schools; (*c*) for inspection; (*d*) for supply of teachers; (*e*) training colleges; (*f*) for regular attendance of children. 4. The efficiency of machinery, both central and local: (*a*) for religious and moral training; (*b*) secular instruction. 5. Board schools. 6. Special schools and their difficulties. 7. Relations of ordinary elementary schools to

other schools. 8. The burden of the cost: (*a*) On the central Government; (*b*) on the rates; (*c*) on voluntary subscribers; (*d*) on the parents. 9. School libraries and museums. 10. School Boards. 11. Grievances. 12 Committee of Council on Education.

The Commissioners had not concluded their deliberations when the present work went to the press.

Royal Military Academy. *See* EDUCATION FOR THE ARMY.

Royal Military College. *See* EDUCATION FOR THE ARMY.

Royal School of Mines. *See* NORMAL SCHOOL OF SCIENCE.

Ruddiman, Thomas (1674–1757), the Scottish grammarian and classical critic, was a native of Banffshire, and was educated at Aberdeen. After spending some time as schoolmaster in Kincardineshire, he repaired in 1699 to Edinburgh, and received an appointment in the Advocates' Library. In 1714 he brought out his well-known *Rudiments of the Latin Tongue*, which at once superseded other works of a similar kind in Scottish schools. In 1714 he started as a publisher and printer in conjunction with his brother Walter, and subsequently published for the University. He next became proprietor of the *Caledonian Mercury*. He was chief librarian in the Advocates' Library from 1730 to 1752, in which latter year he was succeeded by David Hume. Ruddiman was regarded in his day as a very able classical critic, and his edition of Livy was long spoken of as immaculate.

Russia, Education in. *See* LAW (EDUCATIONAL).

Russian Universities. *See* UNIVERSITIES.

Rustication.—In ordinary usage a person who lives in town during 'the season' is said to 'rusticate' in the country when he goes there. Hence an undergraduate who has been 'sent down' by either his college or the university authorities (vice-chancellor and proctors) is said to have been 'rusticated.' This may be for one or more terms, or 'for good.' The distinction between 'gone down' and 'sent down' is therefore important. At Oxford a man 'goes down' in the ordinary course at end of term of eight weeks, or because he is ill or has 'leave to go down'; but he is 'sent down' as a punishment, which obviously must often fall as an expense upon the parents rather than upon the man himself. At the beginning of term men 'go up' on the day of meeting.

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Sanatorium.—A school infirmary or sanatorium should be attached to every boarding-school. It should preferably be in a separate building from the rest of the school, but in small schools where this is unattainable the top storey should be appropriated. A perfect sanatorium should have nurses' rooms, a small kitchen, bath, and water-closets, complete in itself and isolated from the rest of the school. The medical responsibility should be undivided, one medical man attending all the cases of sickness in a school, otherwise there may be clashing of instructions, and thus infection may spread. The provision for sickness is not complete, especially for scarlet fever, without arrangements for the quarantine of doubtful cases. There should be rooms for distinct cases of fever, and other rooms in which doubtful cases may be watched until their true character becomes evident. The schoolmaster may with advantage learn the use of a clinical thermometer, and any patient showing a rise of temperature (above 99° Fahr.) should not be allowed to sleep in the common dormitories till he has been examined by a doctor. Certificates should be demanded from the guardians or parents of children on their return after vacations, stating that there has been no known exposure to infection for at least three weeks. When a boy returns to school without such a certificate he should be placed in quarantine; he should have a warm bath, strong carbolic soap being used, and his clothes and books should be disinfected. The best disinfecting apparatus is Washington Lyon's disinfecting oven, in which superheated steam is employed, though this can only be afforded in large schools. Baking in an ordinary oven such clothes as cannot be washed is quite efficacious.

Saxony, Education in (typical of that

of North Germany). *See* LAW (EDUCATIONAL).

Scandinavian Universities. *See* UNIVERSITIES.

Scholars.—The term applied (1) to persons of high academical attainments; (2) to boys and girls attending public elementary or other schools; (3) to the foundation members of endowed schools or colleges. Foundation scholars at Oxford and Cambridge have their commons free, their rooms rent free, and certain other allowances; sometimes they have fixed stipends. They are usually elected by examination.

Scholars, Classification of. *See* CLASSIFICATION.

Scholarships are prizes of money (sometimes given as remission of fees) to encourage promising boys to become better scholars. A clever boy may by these means work his way from the lowest primary schools to university honours. This has been done, and the 'ladder system' is now developing in many places. In some large towns, e.g. Liverpool, there is a 'Council of Education,' composed of leading citizens, who encourage primary education by paying for scholarships. Some schools offer them on entrance by examination. Clever boys from expensive preparatory schools generally get these scholarships at the great public schools. There are often scholarships competed for within the school, dependent mainly on place and age. If a parent has certain schools in his mind, it is best to write direct to the secretary or head master for information as to the scholarships, and then see the school. The bare facts relating to them are often found in the local directory. Brief summaries of scholarships, their value, &c., are given in Cassell's annual *Educational Year-Book* (6*s.*), or in Bisson's *Our Schools and Colleges*. Some old schools have either close or preference scholarships to certain colleges at Oxford, &c. Thus Eton and King's College, Cambridge, Winchester and New College, Merchant Taylors' and St. John's College, Oxford, are connected. Certain counties have sometimes a preference, and Welsh students have many such scholarships at Jesus College, Oxford. Scholarships are offered by the various university colleges. Private trust funds supply some scholarships (e.g. the *Tancred Studentships*, 100*l.* for seven years, in divinity, law, and medicine at Cambridge). Government gives many Queen's scholarships in connection with training schools, Science and Art Department (*see* WHITWORTH SCHOLARSHIPS), the Indian Civil Service, foreign colleges, &c. There are also scholarships to the Royal Academies for Art and Music, to technical and other colleges. (*See* BURSARY; UNIVERSITY SCHOLARSHIPS, and UNIVERSITY SCHOLARSHIPS FOR WOMEN.)

Scholasticism is the name applied to the system of mediæval thought in the departments chiefly of logic, metaphysics, and theology. It originated in the schools founded by order of Charlemagne, and its main object was the reconciliation of the philosophy of Aristotle with orthodox theology. The Neoplatonist Erigena, in the ninth century, is regarded as its founder. Till the end of the twelfth century the main subject of discussion was the nature of universals. Plato had held that, besides the individual members of a class, there had existed before them from all eternity a universal form (ἰδέα), of which each of them was an embodiment; so that, before any individual man existed, there was a universal type of man, which was the model on which each man was created (*universalia ante rem*). Aristotle, while denying that universal forms existed before or apart from the individual members of a class, yet affirmed that these forms existed in the individual members (*universalia in re*). Realism, in one of these forms, was generally accepted till the time of Roscellinus (*d.* 1125), the founder of nominalism, who held that the universal had no existence either in things or in the mind, but was a mere name used by us to group together individual things, which in themselves had no real relation to one another (*universalia post rem*). On this theory he denied the unity of God, maintaining that the three persons of the Trinity formed three separate Gods, with no real relations to one another. This provoked a vigorous defence of realism from Anselm (1033–1109), who, taking for his motto the words '*Credo ut intelligam*,' endeavoured to prove the harmony of faith and reason in regard to the Trinity and the Incarnation. A modified realism was formulated by William of Champeaux (1071–1121), who, admitting that only individuals had a substantial existence, regarded the universal as consisting of those similar qualities which were common to all the members of a class. This 'theory of indifference' was attacked by Abelard

(1079–1140), the pupil successively of Roscellinus and of William, and the founder of conceptualism, a *via media* between nominalism and realism, which maintains that the universal exists as a concept in the mind, but not in things (*universalia in mente*). The application of Abelard's rationalistic principles to theology caused his condemnation for heresy.

With the thirteenth century began a new period of scholasticism, marked by greatly wider interests. Abelard and the earlier schoolmen had access only to Plato's *Timæus*, and two or three logical treatises of Aristotle; but, during the twelfth century, the rest of Aristotle's surviving works on logic, ethics, psychology, &c., were translated mainly from Arabic versions. The main subject of dispute now was the principle of individuation. The first results of the application of the new knowledge to theology were numerous heresies, but Thomas Aquinas (1227–74), the 'Angelical Doctor,' following mainly his master, Albertus Magnus (1193–1280), the 'Universal Doctor,' reduced the whole Aristotelian philosophy to a system seemingly consistent with the doctrines of the Church. On the question of universals their attitude was that of Aristotelian realism; but they maintained that universals existed also *post rem*, inasmuch as we can think of universals apart from their particular manifestations, and *ante rem*, as ideas in the mind of God. This view became generally adopted. The principle of individuation, that is, the thing which made the individual an individual, was, according to Aquinas, matter. Against this view his great opponent, Duns Scotus, the 'Subtle Master,' pointed out that if individuality depends on matter the individuality of each human soul must be destroyed at death. Scotus held that the species became the individual by the addition of the qualities which distinguished the individual from other members of the same species. The freedom of the will Aquinas regarded as consisting in the power to obey reason rather than instinct; he held that even God's will was subject to reason, and that God commanded what was right simply because it was right. Scotus, on the other hand, maintained the most absolute freedom of the will; to him free will was the power to act in either of two ways without any motive. He held that what was right was right simply because God had willed it, and that the exact opposite would have been right had God willed it. The scholastic world was long divided into Thomists and Scotists; but Thomism, which was the creed of Dante, eventually became the official doctrine of the Roman Church. In fact, as in Aquinas faith and reason seemed to have arrived at the same conclusions through different paths, the climax of scholasticism was reached. Still, even Aquinas abandoned the attempt, made by Anselm, to defend several doctrines, such as the Trinity, on rational grounds. Scotus added the omnipotence of God, the immortality of the soul, and other doctrines to the class of mysteries. Finally, the last great schoolman, William of Occam (*d.* 1347), an extreme Nominalist, denied that any theological doctrine was demonstrable by reason. The schoolmen, however, having proved a theological doctrine inconsistent with reason, called it a mystery, and continued to believe it, inasmuch as they assumed to be as premisses, without examination, the truth both of Aristotle's philosophy and the Church's doctrines. Their neglect of the premisses of an argument was seen also in their numerous subtle discussions on such points as the jurisdiction of archangels, and the question whether devils can repent, which later philosophers have abandoned for lack of data. In fact, ignoring the example of their master, Aristotle, the schoolmen endeavoured to prove everything by deduction, without examining the facts of nature. As the interest in nature increased, this defect was increasingly felt, and so at the beginning of the fifteenth century scholasticism practically expired. The interest in science began to overshadow the interest in philosophy, and it was recognised that in both alike induction must take its place side by side with deduction.

(For further details the histories of philosophy, especially those by Maurice, Lewes, and Uberweg, should be consulted; also Cousin's introduction to *Ouvrages inédits d'Abelard*, 1836; Hauréau's *Histoire de la philosophie scholastique*, 1870; and Poole's *Illustrations of the History of Mediæval Thought*, 1884.)

School Attendance and Infection. *See* COMMUNICABLE DISEASES.

School Attendance Committees.—School attendance committees are appointed under the Elementary Education Act of 1876 (known as 'Lord Sandon's

Act'), to compel the attendance of children at school in districts in which there are no School Boards. The whole of England and Wales is divided under the Elementary Education Act of 1870 ('Mr. Forster's Act') into school districts. If a district has not enough school accommodation for all the children, it must have a School Board; and it may have a School Board in any case if the ratepayers or their representatives in Town Council apply to the Education Department for an order to elect a School Board. In the absence of such a request there are no School Boards in districts with sufficient accommodation. Until 1876 such districts were wholly unaffected by the educational legislation of 1870. By 1876 there was a general desire for compulsory attendance at school throughout the country, but the Government of the day were not prepared to force a School Board upon every district. Hence in the Act of 1876 Lord Sandon provided that in every school district without a School Board an Attendance Committee should be formed. The Attendance Committee in boroughs and town districts is appointed by the Town Council or Urban Sanitary Board; in rural districts it is appointed by the Board of Guardians, the members of the Committee being members of the appointing body. The Committee is reappointed every year. It has nothing to do with the schools, or with the provision of school accommodation. Its business consists almost exclusively in compelling children to attend the voluntary schools, for which purpose it can demand of the managers of the voluntary schools returns and particulars of the attendance of children. The powers of the Committee to compel attendance at school exactly correspond with those of the School Board (*see* SCHOOL BOARD). It appoints a chairman and vice-chairman, a clerk, and attendance officers to look after the children, grants certificates of half-time and full-time, exemption, &c. It reports from time to time to the body which appoints it, but it is responsible to the Education Department, by whom it may be declared 'in default,' and superseded if it neglects its duty. The Committee cannot incur expense without the sanction of the body by whom it is appointed. The money is raised by rate, by the town council, urban authority, or overseers. The Act of 1876, providing for the appointment of Attendance Committees, did not render it incumbent upon the committees to make bye-laws for compelling children to attend school, but it conferred upon the committees power to proceed against employers for employing children of school age during school hours, and powers to prosecute parents who 'habitually' neglect to provide elementary education for their children. These new powers were at the same time conferred upon School Boards, which previously could proceed only under the provisions of the bye-laws. But Mr. Mundella's Act of 1880 compelled all Attendance Committees and School Boards to make bye-laws for compulsory attendance at school, and from that time both School Boards and Attendance Committees have been required to compel the attendance of children at school as provided in the bye laws, and also as provided by Lord Sandon's Act and by the Act of 1880. The Attendance Committee possesses, also, powers similar to those vested in the School Board, of causing children to be sent to Industrial Schools (*q.v.*) and of paying towards the maintenance of children therein; but it cannot establish an Industrial School.

School Boards.—The School Board system was instituted in England and Wales by the Elementary Education Act of 1870, and in Scotland by the Act of 1872. A system slightly different in machinery from that of England and Wales was set up in the Isle of Man in 1871. Under the measure of 1870, commonly called Mr. Forster's Act, the country was planned out into school districts. Cities, boroughs, towns, and rural parishes generally were made into single school districts, but in some cases parishes and hamlets were grouped. Every one of these school districts must provide public elementary school accommodation for all the children for whom efficient elementary instruction was not otherwise provided. The deficiency of accommodation might be provided by voluntary agency; otherwise the district would be compelled to elect a School Board, which would be required to make good the deficiency of accommodation by building Board schools. Where the districts could show a sufficiency of accommodation the election of a School Board was optional. Boroughs could have a School Board in pursuance of a vote of the Town Council; parishes, after a vote in

vestry to the effect that it was expedient that a School Board should be elected. It was also provided that in a district with sufficient school accommodation, if the managers of a voluntary school should inform the Education Department that they were unable or unwilling to continue the school, and that if the school were closed there would be a deficiency of school accommodation, the Department would order a School Board to be elected, and would call upon the new Board to take over the school in question as a Board school, or otherwise provide Board school accommodation. On the passing of Mr. Forster's Act, a considerable number of towns and parishes, without waiting for an inquiry into the amount of their school accommodation, or for an order from the Department, resolved to place themselves under the School Board system, and in November, 1870, the first School Board elections were held. Manchester had the first Board (without a contest) on November 24, and other Boards elected within a few days were those of Liverpool, Rochdale, Leeds, Birmingham, Sheffield, London, Middlesborough, Bolton, Bootle, Bradford, Salford, Nottingham, Congleton, Gateshead, Stockton-on-Tees, Maidstone, Bridgwater, Hanley, Wolverhampton, Coventry, Aberystwith, and Cardigan. A few of these districts, of which Manchester at the time was one, had sufficient voluntary school accommodation, but adopted the School Board system mainly for the sake of the power to compel children to attend school, which could not at that time be had without a School Board. School Boards did not begin to be formed under a compulsory order from the Education Department until many months later; but the London School Board was elected by compulsion, under a section of the Act requiring that Board to be formed forthwith. (*See* LONDON SCHOOL BOARD.) Within the first six months of the passing of the Act there were about two hundred School Boards in England and Wales; at Michaelmas, 1887, there were 2,225, covering a population of about 16,290,000, leaving about 9,500,000 outside the operation of the School Board system. In the next six months, to April, 1888, eight new Boards were elected in small districts. From 1870 to 1880 no district was under the obligation to put itself under the law of compulsory attendance at school; and from 1870 to 1876 even the School Boards which had made bye-laws for compelling attendance were not bound to enforce their bye-laws. The Act of 1876, called 'Lord Sandon's Act,' prescribed that bye-laws must be enforced, and set up a new authority called the School Attendance Committee (*q.v.*) to be elected in all school districts without School Boards, and these Attendance Committees had the (optional) power to make bye-laws, which must be enforced. The Act of 1880, called Mr. Mundella's Act, required all School Boards and Attendance Committees to make bye-laws for compelling parents to cause their children to attend school, and so compulsory attendance was made universal. In school districts of less than five thousand inhabitants the School Board consists of five members; up to twenty thousand population, seven members; up to forty thousand, nine members; up to seventy-five thousand, eleven members; up to one hundred thousand, thirteen members; above that population, fifteen members, excepting London, which is specially provided for. The School Boards are elected by the ratepayers once in three years. The voting is on the cumulative plan, each elector having as many votes as there are members to be elected, with the privilege of distributing the votes among the candidates as he thinks fit. Any man or woman twenty-one years of age may be a candidate. At the first meeting of the School Board after a first election, and at the first meeting after each triennial election, a chairman and vice-chairman must be elected, and these proceedings must be reported to the Education Department at Whitehall. The foremost duty of the School Board is to see that there is public elementary school accommodation for all the children of the district between the ages of three and eighteen for whom instruction in public elementary education is needed, making good any deficiency of accommodation by establishing Board Schools. The next great duty of the Board is to secure the attendance at school of all the children between the ages of five and fourteen, subject to certain exemptions. A School Board clerk must be appointed, and a treasurer. These may be paid officers, or they may be members of the Board, in which case they cannot be paid. Provision is also made for the appointment of attendance officers to be engaged in the prac-

tical work of causing the children of the district to attend school. The Board usually begins its work by making a census of the child population of its district. Of the total number of children, the proportion that requires education in public elementary schools varies, in a limited degree, according to the circumstances of the population; but as a general rule the number of children for whom public elementary schools must be provided is about one sixth of the entire population. The schools must be 'efficient and suitable.' An excess of accommodation in one part of the town or district must not be made to balance a deficiency in another quarter. The distance from the homes of the children must be taken into consideration. An allowance is made for the accommodation in private schools, unless the schools and the instruction are very inefficient. The School Board has no power to close private schools, however inefficient, or to insist upon the keeping of attendance registers therein, or to require the co-operation of private school keepers in the work of securing regular attendance. But if there is reason to believe that the private school is an unsuitable place for the assembly of children, or that the teaching is inefficient, the parent can be prosecuted for not causing his child to receive efficient elementary instruction, and it rests with the parent to prove to the magistrates that his child is under efficient elementary instruction. And though the private school may be efficient, if the Board's officers discover that the child's attendance is irregular, the parent can be prosecuted. Voluntary schools in receipt of a Government grant—i.e. Church of England schools, British schools, Wesleyan, Roman Catholic, &c.—are fully counted in arriving at an estimate of the Board School accommodation required. But if the voluntary school fees are too high for some of the children, and in some cases if there is anything in the school which tends to prevent the seats from being all filled, the accommodation is held to be 'unsuitable.' For example, if the only school places available for a number of Protestant children were in a Roman Catholic school, and if there appeared to be a reluctance on the part of the parents to send their children to such school, the School Board would be called upon to provide accommodation for those children. The School Board has no power to enter voluntary schools, or in any way to interfere with the management of them; but it can demand from the voluntary school regular returns of the attendance of children, and evidence of irregular attendance or absence. It is also the duty of the School Board to report to the Education Department any cases which are brought under its attention of children being improperly excluded from, or refused admission into, a voluntary school; for public elementary schools (i.e. elementary schools receiving Government grants) are not permitted to exclude children except on 'reasonable grounds'—of which the Education Department is the judge. The penalty for improperly excluding children is forfeiture of the grant. When there is a sufficiency of efficient and suitable accommodation in a School Board District, the sole business of the School Board is to see that all the children attend school. In the case of a deficiency of accommodation the Board proceeds to provide Board schools. If there is a difficulty in procuring ground on which to build a school, the Board may take a site compulsorily, under the Lands Clauses Consolidation Act. To meet the cost of site and school-building, the Board borrows money on the security of the rates—generally, but not always, of the Public Works Loan Commissioners, the loan to be paid off, principal and interest, in fifty years. The loan is subject to the sanction of the Education Department; the school plans must also be approved by the Department; and their lordships of the Department must be satisfied as to the number of children requiring accommodation. There must be in the school, at least, ten square feet, and one hundred cubic feet, of space for each child. The teachers are appointed by the School Board. The head teacher must hold a certificate of qualification, granted by the Department, and there are full and elaborate regulations laid down by the Department as to the number of children who may be under the control of each certificated teacher (*q.v.*). The Board may manage the school, or may appoint unpaid managers not necessarily members of the Board. The work of the schools is to a large extent regulated by the 'Code' (*q.v.*), which is a body of regulations issued by the Education Department, revised more or less every year, prescribing the conditions under which the Government

grant (*q.v.*) is paid towards the maintenance of the school. Board schools and voluntary schools are treated exactly alike under the Code. Her Majesty's Inspectors from the Education Department visit the schools from time to time to examine the children and inspect the work generally, and the amount of the grant depends upon their report to Whitehall. There is a grant per head for the average attendance, a 'merit grant' for the school as a whole, and grants per head for the children for passing in 'elementary subjects,' in 'class subjects,' and in 'specific subjects.' The elementary subjects are reading, writing, and arithmetic—these, and needle-work for girls, are compulsory. Class subjects and specific subjects are taught, or not, at the option of the managers. The recognised class subjects are singing, English, geography, elementary science, and history, with needlework for girls. Specific subjects, taken by children in the upper classes individually, are algebra, mensuration, mechanics, Euclid, physiology, Latin, French, &c. There are grants also for instructing and training pupil-teachers. The average grant per child in the schools is a little under twenty shillings.

There are three sources of income for School Boards, viz. the Government grant, the children's fees, and the rates. Whatever deficiency there is after counting the grant and the children's fees is made up from the school rate, and upon the school rate fall the establishment and administrative expenses of the School Board, the payment of interest and instalments of the principal of loans, and all other expenses whatever. The School Board makes an estimate at the beginning of the year of the amount that will be required from the ratepayers, and sends a precept for the amount required to the rating authority, and it is the business of the rating authority, without exercising any judgment or control over this amount, to collect the money from the ratepayers and pay it to the School Board. The School Board's accounts of income and expenditure are audited from time to time by auditors sent by the Local Government Board, and if any items of expenditure are not legal there is a surcharge to that amount upon the members of the School Board personally. The surcharge is subject to an appeal to the Local Government Board. The total amount drawn from the rates by the School Boards in England and Wales in 1886 was 2,542,168*l.*; the total paid to the Boards in the shape of grants to Board schools, 1,151,000*l.* Nearly three millions sterling was spent in maintenance of Board schools.

Children's *fees* in public elementary schools must not exceed ninepence a week. More than half the children in public elementary schools pay less than threepence a week; but a very small proportion pay sixpence and upwards. As a general rule fees in Board schools are lower than in voluntary schools. The scale of fees in Board schools must be sanctioned by the Department; the fees in voluntary schools are not subject to the judgment of the Department. It has been ruled by the High Court of Justice that school-fees should be paid for the week at the beginning of the week. If the fee is not paid on the Monday morning the child may be refused admission and the parent may be prosecuted and convicted for neglecting to cause his child to attend school; but if the child is admitted without prepayment of the fee there is no means of recovering the fee by legal process. If the parent proves that he is unable, by reason of poverty, to pay the fee at a Board school the School Board may 'remit' the fee. The School Board is not compelled to remit; but if there is no remission, and the fee is not paid by the Poor Law Guardians, and if the parent can satisfy a magistrate that he is too poor to pay the fee, the Board cannot compel the parent to send the child to school. In such a case the Department would call the School Board to account for not securing the attendance of the children, and the Board might be declared to be 'in default,' and be superseded by persons appointed by the Department to form a School Board and to carry on the work. In like manner if the School Board fail to provide sufficient school accommodation it may be declared 'in default' and be superseded. Parents unable to pay school-fees may also apply to the Poor Law Guardians for payment, and it is the duty of the Guardians to pay children's school-fees in cases of poverty, whether in Board schools (if the School Board do not remit) or in voluntary schools. Voluntary schools may be converted into Board schools by transfer from the managers of the voluntary schools to the School Boards by mutual agreement, subject to the sanc-

tion of the Department. Transferred schools are in all respects in the position of Board schools. Compulsory attendance at school is provided for by bye-laws made by the School Board in accordance with the 74th section of the Act of 1870.

Under the bye-laws children between the ages of 5 and 13 must attend school, subject to certain exemptions, or be 'under efficient instruction in some other manner.' Up to the age of 10 there is no exemption. Between the ages of 10 and 13 children are usually exempted under the bye-laws, *half time* on passing a certain standard of examination, and *full time* on passing a certain higher standard. The standards of exemption are to some extent within the option of the School Board, and they vary in different districts. It is the rule of the Department, and generally provided in the bye-laws, that a child shall not be entitled to half-time exemption from attendance at school, even on passing the specified standard, unless there is a necessity for its employment in consequence of the poverty of the parent. In addition to these rules of compulsory attendance under the bye-laws, there is, under Lord Sandon's Act of 1876, compulsory attendance for children between the ages of 13 and 14, unless they have passed the fourth standard. The remedy for neglect on the part of the parent to cause his child to attend school in accordance with the provisions of the bye-laws and the Acts is that he shall be summoned by the School Board to answer for the offence before the magistrates, and on conviction the fine, including costs, must not exceed five shillings for each offence, with proportionate imprisonment in default of payment of the fine. Since the passing of the Summary Jurisdiction Act in 1879 defendants in these cases have not usually been committed to prison until after the failure to recover the fine by distress; but the defendant must pay the costs of the distress in addition to the fine and costs on the hearing. The defendant may plead a 'reasonable excuse' for not causing his child to attend school. The reasonable excuses mentioned in the Act are, that the child is under efficient instruction in some other manner; that the child has been prevented from attending school by sickness, or any unavoidable cause; that there is no public elementary school open which the child can attend within such distance, not exceeding three miles, measured according to the nearest road, from the residence of such child. But there may be other reasonable excuses, of which the School Board, and afterwards the magistrates, must be the judges, and the magistrates' decision on the point is subject to appeal to the High Court of Justice. Besides the penalty against the parent there is a penalty against the employer who employs a child who ought to be at school, the fine in this case not exceeding forty shillings. The parent who employs his own child is liable to be prosecuted for unlawful employment. Besides carrying on Board schools the School Board may establish Industrial and Day-industrial Schools (*q.v.*) for neglected children, or pay towards the maintenance of children in voluntary industrial schools, and may take proceedings before the magistrates for causing children to be sent to industrial schools. Some Boards have established 'Truant Schools' (*q.v.*), where children are reclaimed from vagrant habits in a more temporary manner than in the case of industrial schools. (*See* SCHOOL ATTENDANCE COMMITTEE.)

School Buildings. *See* ARCHITECTURE OF SCHOOLS.

School Furniture. *See* FURNITURE.

School Management.—1. *External.*—In the phraseology of the Elementary Education Acts and of the Code, school management is the function of the body of men, whether the legal trustees or not, who are responsible in the eyes of the Education Department for the maintenance of the fabric and the machinery of a public elementary school. In this sense the 'managers' correspond to the 'governors' or 'trustees' of an endowed school. School Boards are the managers of all schools provided by them, but by a special provision of the Education Act of 1870, which has been taken advantage of by some Boards, notably by those of London and Liverpool, they may delegate these functions, with or without conditions or restrictions, to a body of managers appointed by them, consisting of not less than three persons. Usually a portion only of the duties of management is assigned to such managers. It is the practice of the larger School Boards to exercise the whole, or the undelegated part, of their functions as managers through a School-management Committee, which sees to the carrying out

of the regulations sanctioned by the Board for the management of its schools, and periodically reports its proceedings to the Board for approval.

School management in this sense has become of late years, owing to the enormous extension of popular education, a task of great complexity and detail, for the effective discharge of which large demands are made on the time, judgment, and practical knowledge of the ladies and gentlemen entrusted with the work. However, the experience of School Boards since the framing of the Education Act has accumulated to a degree which has rendered it possible to lay down with some definiteness the duties of school management which would fall within the province of the managers without unduly and injuriously interfering with the internal management of the school, which is the natural province of the head teacher, or with the prerogatives of the Board, which, as paymaster responsible to the ratepayers and to the Education Department, must retain its legal authority over all action involving a new principle or a hitherto unsanctioned expenditure. When the hours and subjects of instruction, the amount and nature of religious teaching, the nature and strength of the teaching staff, the school fee, and the scale of salaries have been determined by the Board, the chief duties of the school-management committee will consist in selecting and recommending to the Board the teachers for appointment or promotion, in securing the efficient instruction of the pupil-teachers, in dealing with all matters arising out of H.M.'s Inspector's report, in making regulations for the admission of scholars, and for the keeping of registers, stock and stores accounts, &c., in laying down the methods of enforcing discipline permissible to head and assistant teachers, in approving time-tables and text-books, and finally in seeing, either personally or by inspectors and other officials, that the Board's regulations are duly observed, and the efficiency of the school maintained. All complaints of infringement of the regulations, of abuse of authority, of neglect of duties would be reported in the first instance to the committee, and either dealt with summarily or taken to the Board for adjudication, according to the nature of the charge and the limit of the powers entrusted to the committee.

In the case of secondary schools, the amount of school management undertaken by the governing bodies is of a much more limited extent than in the case of primary schools. This has come about largely from long-established usage, which has recognised the almost absolute rule of the head master of a public school. But the amount has been thus limited recently by the action of the Public and Endowed Schools Commissioners and the Charity Commissioners, who in their schemes for the management of endowed schools have legislated on the principle that, as between the governors and the head master, the latter should have a full share of responsibility and therefore an ample share of power.

The functions of school management devolving upon governing bodies under the schemes of the Charity Commissioners are: (1) The supervision and control of the income, expenditure, and property of the foundation, subject in certain cases to the supreme control of the Commissioners; (2) the erection, enlargement, or alteration of school buildings, subject to the consent of the Commissioners; (3) the framing of regulations for religious instruction, subject to the scholar's right of exemption; (4) the appointment and dismissal of head masters and mistresses; (5) the fixing the number and remuneration of the teaching staff; (6) the determination of the qualifications and terms of appointment of the staff; (7) the power to prescribe the general subjects of instruction, the relative prominence and value to be given to each group of subjects, and the organisation of the different departments and subjects of study, the division of the year into terms and vacations, and the number of school hours in each week and of holidays to be given in each term, the general supervision of all the school buildings and arrangements; but before exercising any of these powers the governors are enjoined in all cases to consult the head master or mistress; (8) the determination of the number of scholars to be admitted, the limits of age at admission and leaving, and the qualifications for admission; (9) the fixing the amount of entrance and tuition fees, subject to the approval of the Commissioners.

The head master or mistress usually has the power of appointment and dismissal of all assistant teachers, and sub-

ject to any discretion of the governors, has under his or her control the choice of books, the method of teaching, the arrangement of classes and school hours, and generally the whole internal organisation, management, and discipline of the school. The power of expulsion of a scholar is also usually given, subject to a full report of the case being made to the governors. The power of dismissal of assistant teachers has sometimes been qualified by a right of appeal to the governors, or by some standing orders intended to check the capricious or arbitrary use of that power. Public opinion is divided as to the wisdom of giving this power to head masters and mistresses, but the Charity Commissioners have generally been in favour of 'dismissal without appeal.'

2. *Internal.*—The principles that guide the internal arrangement of a school are common in essence to all schools alike, whatever may be the social class or range of ages of the scholars. For they assume the common attributes of immaturity and dependence in the taught, and of maturity of knowledge and judgment, together with practical and moral authority, in the teacher. School management then, in this sense, may be looked at in its most general aspect. An efficient public school and an efficient elementary school are alike produced and maintained by the faithful application of similar means, appliances, and laws of good management. To a certain extent it is true that schools are differentiated in their characteristics, their methods of discipline, their treatment of individuals, by the more or less favourable social condition of the scholars, or by their greater or less youthfulness. For instance, an appeal to the sense of honour or of *esprit de corps* may be made with success in one kind of school but not in another; and, the greater the average age of the scholars, the less need is there to rule them, individually or collectively, as creatures of mere instinct rather than of reason; and the greater consequently is the range of action over which, under the influence of the teacher, principle rather than precept can exercise its restraining and governing power. But these differences are of degree, not of kind. For successful school management well-planned school buildings are the first essential (*see* ARCHITECTURE). However perfect the teacher, the ideal of a good school is unattainable in defective buildings. 'A place for everything and everything in its place' reduces friction of all kinds—the opportunity of offending, the number of punishable offences, the necessity for vigilance and for fresh legislation—to a minimum. The few regulations that exist are borne in upon the scholar's mind as requisite for the preservation of his property, the peace both of his lesson-time and recreation-time, and his freedom from anxiety and irritation at every moment of the school day; and a greater percentage of the scholars are therefore instinctively enlisted on the side of law and order, and assist in maintaining them. But at the best of times the position of a school, as of any large, highly-organised, and compact community, is a position of unstable equilibrium; it is always liable to be resolved into its naturally volatile and impressionable components. Hence an able and vigorous administrator is of prime importance. The qualities of a good head teacher are, first, belief in the value of knowledge; secondly, organising and administrative ability; thirdly, professional experience. The first implies that the teacher is not only himself a student, but can create and foster the student's zeal in his scholars; the second covers all that goes to make a good disciplinarian, neither a martinet nor a bully on the one hand, nor, on the other, one that shrinks from sternness when confronted with an offence which, if unpunished, demoralises the individual and threatens the community; the third includes the knowledge of the science of his profession as well as the possession of the foresight which comes from actual practice of the art—the latter enabling the teacher to measure the effects and defects likely to show themselves in a given course of action, and so making him prudent; while the former assists him more readily to the cause, and from the cause to the cure, and so equips him with wisdom.

The detailed points of school management coming under the head of *Organisation* are: The cleaning of the premises, buildings and furniture; the warming and ventilation of corridors and class-rooms, the classification of the scholars and their re-classification for special subjects, the selection of the text-books, the drawing up of the time-tables, giving in each class the subjects taught, the range of each subject, the number of hours per week to be-

devoted to each subject, and the length of each lesson; the laying down of regulations for opening and closing school, for the simultaneous movements of the classes between class-room and class-room, and between class-room and recreation-ground; the determination of the form of school registers (if not determined already by the Code, as in public elementary schools), and of the periodical reports to parents. Under the head of *Government* the most important point is Discipline (*q.v.*), steady, certain, just, and kind. By such discipline, together with careful attention to every detail of organisation, and a skilful use of the indirect means of discipline by which obedience becomes a matter of self-interest or self-choice, it is possible to conduct a school without any resort to physical force. Doubtless, it would be going too far to say with Mr. Wild, that whenever a master found it necessary to flog a boy he deserved to be flogged himself. But the presence of corporal punishment (*q.v.*) in a school is a confession of weakness, a confession either that the teacher does not know how to use the best means of discipline, or that the scholars are not amenable to such means. A school with such a teacher or such scholars is not an ideal school. In the ideal school there would be a graduated process of dealing with offenders, through admonition, warning, deprivation of privileges, formal reprimand to head teacher and to parents, and detention, leading up to the ultimatum—suspension and dismissal. In a day-school, where the parent is accessible to the teacher, and both parent and teacher are in sympathy on the subject of a culprit's reformation (as would naturally be the case), the mere possession of the power of dismissal lying behind the milder forms of reproof and punishment, would be sufficient to procure the submission demanded and the reformation sought. But offenders must be punished, and in the infliction of punishment the other object, the good of the school at large, must be steadily kept in view. The just punishment of offenders not only preserves a school from evils which might grow, but also raises its moral tone by thus emphasizing the difference between right and wrong.

The third element of school management is that of *Instruction*—itself the end and object of school, towards which organisation and good government are only the means. Here the tests of quality as well as quantity have to be applied; and a head teacher's primary duty—when he is allowed the appointment of his assistants—is to secure a teaching staff by whose handling of every subject of instruction the scholars will derive mental and moral discipline, as well as acquire knowledge. Next to the careful selection of teachers who have this capacity, who are, besides, in sympathy with the aim of the school, who are intelligently appreciative of the head teacher's ideals, and are prepared to accept and apply the routine, discipline, and modes of punishment which he has formulated, the most important point is for the whole teaching staff to come to an agreement on good general methods for the treatment of each subject, for the handling of the scholars in classes, and for the gauging and registering their individual work, so that, as far as practicable, each scholar may feel that he is being treated on definite and well-understood principles, both as to work and conduct, which are the same everywhere, at every hour, and with every teacher. Supervision of every part of the school work and periodical examination are essential parts of a head teacher's duty; but it is all-important that he should teach as well. The proportion of time to be devoted to supervision and teaching respectively must be determined by the age and experience of the assistant staff. Of the various questions relating to internal school management, too numerous to be treated of here in any detail, that of the mode of gauging the value of the work done by each scholar at each lesson is one of the most essential. It is important for the teacher to be continually making a conscious estimate of each scholar's work, that he may be guided in his treatment of him by the more accurate knowledge thus obtained of his mental state; and it is most desirable that the scholar—especially the young scholar—should have his teacher's estimate of his work continually presented to him side by side with that of his classmates', in order that the stimulus of emulation may be applied. It must be borne in mind, however, that, in using emulation (*q.v.*) as a stimulus, the teacher is dealing with a good servant but a bad master, and that careful bounds must be placed upon its use. It is quite possible for a teacher dexterously to employ the stimulus of

place-taking, *marking*, and other devices, so as to produce high examination results, and yet, at the same time, to distinctly lower the character of his scholars, and to destroy in time his own freshness, enthusiasm, and influence. Of these methods, place-taking is, perhaps, the most dangerous, from the fact that it projects emulation more immediately and more incessantly across every educational effort that the scholar makes. But this, the most time-honoured method of marking, is now almost obsolete; at the best, the system only did very rough and ready justice; it was noisy in process, it involved in nearly every case either the standing of the class for the whole of the lesson, or the being seated on forms; and now that single or dual desks are coming into general use, and order and quiet are really getting to be understood in schools, it will die a natural death. No marking of any kind takes place as a rule in elementary schools; and the teacher is thus able to employ freely that best of all methods of questioning, which consists in asking the question to the whole class before naming the scholar who is to answer it. But marking is regularly practised in secondary schools, and the methods adopted are various. The plan most prevalent (especially in junior classes), because it is considered most economical of a master's time, is that in which the exercises are first distributed among the class, so that no scholar looks over his own exercise, and then the correct version is read out, or written on the board, and the mistakes of each exercise are marked by the class. This is open to the obvious objection that the mistakes of the individual scholars do not come under the teacher's eye, so that he loses touch of their mental condition, and much of his teaching misses the mark. And yet, again, the teacher has constantly to guard, on the one hand, against a system of marking which makes his teaching *in school* dull, wooden, mechanical, uninspiring, and, on the other, against the effect of the dreary routine of looking over exercises *out of school*, which exhausts that store of freshness and elasticity of spirits so essential to his success as a teacher.

Schoolmaster Abroad (The). — Lord Brougham's famous expression, in contrasting coercion and education: 'There is another personage abroad . . . the schoolmaster is abroad; and I trust to him, armed with his primer, against the soldier in full array.'

Schoolmen.—The name given to the philosophers and theologians of the Middle Ages who were devoted to the teaching of Aristotle. Dialectical subtlety was their distinguishing characteristic. They lectured in cathedral schools, and their writings were 'wrangled' about or discussed in the University Schools (*q.v.*). They were chiefly learned theologians, and lived between the ninth and the sixteenth centuries. Anselm (A.D. 1050–1117) was 'Doctor Scholasticus'; Epiphanius, an Italian scholar of the sixth century, was surnamed 'the scholastic.' The word survives in the phrase 'the scholastic profession.' (*See* art. SCHOLASTICISM.)

School Surgery.—Some such knowledge as is obtained by attending the first course of lectures given in connection with the St. John's Ambulance Association is of great value to all teachers. It will be impossible to give in detail the first treatment of all the accidents which occur in school life; a few principles and the commoner examples only can be given, leaving the reader to refer to one of the many popular text-books on the subject, and especially in all doubtful cases to obtain medical aid as quickly as possible. The application of the following simple rules, when fits, or fainting, or hæmorrhage, occur, might, however, prevent danger to life. Panic is generated by ignorance, and it is important that the teacher should know how to proceed until the doctor comes.

Fainting is not infrequent when a school is overcrowded or ill-ventilated. The patient should be laid flat on his back, and all tight clothing removed from his neck and chest; overcrowding round him should be avoided, and windows should be thrown wide open. Do not attempt to pour anything down the throat while the patient is unconscious, or he may be choked. Smelling-salts to the nostrils are useful. *Fits*, either epileptic or hysterical, are apt to occur, the latter more particularly in girls' schools. In both, the patient should be laid gently on the floor, tight clothing loosened, and no further attempt at active treatment made. If the fit is hysterical it is necessary not to allow the patient to attract much attention, or a repetition of the fit may be expected. In *apparent drowning* the patient should be placed on

his back, the mouth cleansed from mud, &c., and the tongue held drawn forward out of the mouth. Then the arms should be grasped near the elbows, and should be alternately drawn over the patient's head and pressed down firmly against the sides of the chest. This manipulation should be repeated fifteen times every minute, and persevered in for some time, even though there are no signs of returning life. During this time other persons should procure hot bottles and blankets, and rub the legs steadily to promote the circulation. Children occasionally thrust *foreign bodies* into the ear or nostril. In the latter case they can generally be seized by a pair of tweezers or hooked down by a fine wire hoop; sometimes a dose of snuff will serve to dislodge them. If a foreign body is lodged in the ear, the only manipulation that is justifiable by the teacher is syringing out the ear with warm water. If this is unsuccessful the patient should be sent home or to a medical man. If a pea is lodged in the ear, syringing is better omitted, as the pea may swell and thus become more firmly impacted. *Particles of dust*, &c., frequently cause great irritation in the eye. Try and invert the upper eyelid, and then the speck can usually be seen and removed with the corner of a handkerchief. If it cannot be seen, drop a little castor-oil into the eye and keep the eye closed and free from movements by means of a wet compress and bandage over it. In a few hours the speck generally works its own way down to the inner corner of the eye. If a *needle* becomes imbedded in the skin keep the affected part fixed in one position and see a surgeon. *Splinters* and thorns may usually be removed by cutting through the top skin (epidermis) carefully with a sharp knife, and then seizing the fragment with a pair of tweezers. If the splinter is under the nail, it is sometimes necessary to cut down the nail. The *stings* of bees and wasps and nettle-stings are best relieved by bathing with hot water and squeezing out the poison, and then applying a strong solution of bicarbonate of soda to the affected part. The *bite of a dog* is not in itself serious, unless the dog is mad. If the dog is captured it is a great mistake to kill it, as thus the patient may be kept in painful suspense as to whether he really was bitten by a mad dog or not. The best plan is to keep the dog in safe confinement and watch if any symptoms of rabies develop. The wound should be bathed with hot water, and its bleeding freely encouraged, if necessary by enlarging it with a sharp pocket-knife. Lunar caustic is of little use to apply afterwards, as it does not penetrate deeply. Most schools have strong nitric acid on the premises, and this should be applied, by means of a penholder dipped in the acid, to the interior of the wound. *Wounds* of varying degree and severity are apt to occur in school life. The wound should be thoroughly washed and freed from dirt or other foreign matter. Then the edges should be brought close together, and a pad of linen soaked in carbolised water applied by means of a bandage. Wounds of the head and all the more severe wounds should receive a surgeon's attention. *Abrasions* in which the skin is rubbed off should be washed with cold water and then some Friar's balsam or collodion applied. Never apply sticking-plaster next to a wound or abrasion; it is almost certain to produce suppuration. *Hæmorrhage* may be due to a wound, or may come from the nose, lungs, or other parts, independently of external injury. The most serious form of bleeding is arterial, in which the blood is bright scarlet, and comes out in intermittent jets. It is best controlled by pressing on the main artery higher up in the limb than the bleeding point, or by fixing a firm pad over the wound and keeping it firmly pressed on until a surgeon can be obtained. If coughing or vomiting of blood occurs the patient should be kept absolutely quiet, and have only ice to suck. In *bleeding from the nose* apply iced compresses to the forehead and nape of neck, and if necessary syringe out the nostrils with cold water. If this does not answer put some alum or tannin in the water to be injected into the nostril. If *burns or scalds* occur the best immediate application to relieve pain is a linen cloth soaked in a saturated solution of bicarbonate of soda. *Fractures* of bones are recognised by the inability to use a limb and the change in its shape. A splint may be improvised by taking pieces of a box-lid; or for children, brown paper folded up so as to make it stiff and rigid. The main point is to keep the injured part fixed till a surgeon arrives. *Sprains* should be bandaged immediately, kept fixed, and a cold lotion applied. *Contusions*, as from

a kick on the shin or a blow over the eye, result in an effusion of blood under the skin. A cold evaporating lotion is required.

Schools.—This word is used at Oxford in the more historic sense. At Oxford a man reads 'for the schools,' at Cambridge 'for the tripos,' i.e. for 'Greats.' At Oxford a man may obtain his B.A. degree either through the Pass or Honour Schools. About two-thirds take a Pass Degree still. But the fact that there are about 500 scholarships and nearly 200 exhibitions held by nearly one-fourth of the undergraduates (about 3,000) keeps up the Honour Schools. For some years there has been an increase in the percentage of men who read for honours in the Final Schools. The table will fairly well compare the two oldest English universities. The Oxford figures were obtained by counting the list of candidates in 1887, the Cambridge figures from the Calendar of 1886. The actual numbers, the percentages, and the order of patronage are given.

Camb.	Oxf.		Oxf.	Camb.	Oxf.	Camb.
1	1	Classics	136	138	32	26·3
—	—	Moral Science	—	10	—	2
6	2	History	107	34	25·1	6·4
5	3	Law	76	54	18	10·2
4	4	Theology	62	45	14·5	8·5
3	5	Science	27	114	6·3	21·7
2	6	Mathematics	18	130	4·2	24·7
			426	525	—	—

This list excludes sixty-three who took the Preliminary Honour Examination in Natural Science. During the ten years 1877–88 there was an increase of 50 per cent. in the men who took honours compared with an increase of 13 per cent. (3,062 against 2,659) of the number of undergraduates at Oxford. The expansion or greater nationalisation of the university, as some will call it, has thus been favourable to the Honour Schools. More work is done; but it is not so much purely classics or mathematics which are taken up. As many, if not more men, take classics at Cambridge as at Oxford, where only one-third of the Honours men take up the Final Classical School. The fellowships and prizes are still mainly for classics at one place and mathematics at the other. But there is a strong staff of science professors compared with the present number of students (1887). At Oxford, especially, the science men have to get most of their science tuition outside their own college. They nearly all go to the university laboratories for practical work. The expense in new buildings at both places has been very great since 1876. Their absence prevented men from taking up these subjects before. In 1887 a Final Honour Oriental School was established. Cambridge has also started one in modern languages. Oxford in 1887 prepared a scheme for one in modern languages and literature, and some simple one will probably be adopted. The emoluments for the newer professorships and readerships have generally been supplied by contributions made by the several colleges at the instance of the last Royal Commission. The Classical School at Oxford, it may be noticed, is known as Literæ Humaniores. It requires a knowledge of philosophy and history; hence there is no moral science school at Oxford. Mathematical and physical science, jurisprudence, natural science are the full titles of other schools at Oxford.

The Schools at Oxford are also the buildings themselves in which the university examinations of men 'in for the schools' are conducted. The 'old schools' are very ancient rooms, now being utilised by the Bodleian Library. The names of the *scholæ* can still be seen over the doors. The 'new schools' in the High Street are palatial buildings of beautiful marbles of every kind, and cost over 200,000*l*. There is sometimes not room for all the candidates. The rooms, being well warmed and lit, are very useful for lectures, &c.

Schools Examination Syndicate.—*See* OXFORD AND CAMBRIDGE SCHOOLS EXAMINATION BOARD.

Schools of Antiquity.—Education was born with the birth of children; and its beginnings coincide with the dawn of the day on which the parents of infancy first awoke to the perilous blessing of a common and dependent offspring. The earliest education is that of the family; and in the order of nature the earliest teachers are the parents—the mother, in the order of time, slightly, yet vitally, taking precedence. It was long before any attempt was made to improve generations as they succeeded each other; and in proportion as education became more complicated, it passed from the hearth to the altar. The

earliest schools were those of the priests; and convenience, gratitude, and assumption long and almost universally confirmed the hieratic monopoly. The Greeks were the first to develop a science of education as distinct from ecclesiastical training; and to-day the world is governed not from the hearth alone, or from the altar alone, or even from the throne alone, but from the desk. It is the schoolmaster who, in a scarcely secondary degree, imparts the knowledge and moulds the opinion and the sentiments of loyalty, honour, and conscience which make possible the continuance of the social edifice. The schoolmasters of a nation hold in commission the paternity of the nation; they are the deputy fathers of the rising generation. The sanctities, privileges, and responsibilities of the originators of life devolve upon the men whose aim it is to make that life an honour, a utility, and a blessing.

The schools of antiquity were in the nature of things the schools of the Orient; and the education of the primeval nations of the East conformed to universal experience so far that its administration was an appanage of the priesthood, the members of which were the only men of learning, and, by consequence, the only men who possessed the power of imparting learning to others. Speaking generally of the characteristics of the knowledge which was hieratically communicated, it may be said that it was in the main religious, ethical, prudential; and that the final purpose of instruction was good conduct. As the matter of instruction was knowledge bearing the sanction of authority, the learner was debarred from free inquiry, and the general attitude was one of immobility. As the know ledge of the day was embodied in language, the process of learning consisted in the interpretation of books, and so involved a large and constant use of the memory; and this literal memorising of the principles and rules of conduct promoted fixity, stability, and sterility of character As the purpose of instruction was guidance, there was no appearance of the conception that one main motive of education is discipline or culture. On the whole, education was administered so as to perpetuate class distinctions. There was little or no suggestion of the idea that education is a universal right and a universal good.

Assyria, Babylonia, Chaldæa. — The precedence of the nations who are in a position to enter into the candidature for the honours of the primacy of civilisation is not to be definitely settled by any partial master of ethnological ceremonies, or any prejudiced marshal of chronological events. No one can deny the propriety of placing Assyria, Babylonia, and Chaldæa—which, with regard to the rest of the world, and for the present purpose, are as nearly as possible convertible terms —in the identical places for which they are alphabetically designated; for there is little doubt that Babylonia is the oldest civilised country in Asia, and that even outside that continent, only Egypt can rival it in this respect. But the history of Babylonia has an interest beyond that of Egypt on account of its more intimate connection with our own civilisation; for Babylonia was the centre from which civilisation spread into Assyria, from thence to Asia Minor and Phœnicia, from these again to Greece and Rome, and from Rome to modern Europe. As the latest particular illustration of this radiation of culture, it is now beginning to be understood how great an influence the Babylonian laws and customs have exercised on those of other nations; an influence which is to be recognised on the laws and customs of the Greeks, for instance, just as the influence of Babylonian precedents and conceptions has recently been recognised upon Hellenic art, literature, religion, and philosophy. An examination of the legal tablets of Babylonia reveals the existence of statutes and customs which have been continued, as transmitted by other peoples as instruments or intermediaries, among the Greeks and Romans, and through the latter have affected the principles and practice of our own jurisprudence. The same considerations which determine our lawyers to a study of the Justinian Code are also valid to attract them to follow up the devious stream of formulated justice to the source beyond which it cannot be traced, in Mesopotamia. Our astronomical system came originally from the plains of Chaldæa, where also mathematics, measures of time and capacity, weights and scales, and all the sciences of ancient times received study and attention, and where the arts of building, sculpture, painting, gem-engraving, metal-work,

weaving, and many others made proportionate progress. Assyria possessed but little native literature, but was essentially a land of soldiers; while the more peaceful pursuits had their home in Babylonia, where the scribe caste comprised many of the highest in the land, and where the universities of Erech and Borsippa were renowned down to classical times. It was not till the reign of Assur-bani-pal that any attempt was made to rival Babylon in learning; then for the first time original compositions came from the pens of Assyrian scholars, and works were even written in the dead language of Accad. In the palace of Assur-bani-pal at Nineveh has been discovered a large library consisting of many thousand tablets, large numbers of which are now stored in the British Museum. This library, in all probability, owes its origin to the keen political foresight of Esar-haddon, but was completed by his son Assur-bani-pal, whose name occurs on most of the tablets. Primitively, it may be stated *par parenthèse*, the Babylonians appear to have used for writing materials papyrus, bark, and other vegetable substances. Considering, however, that all documents of so fragile and, comparatively speaking, of so ephemeral a nature have long since perished, it is fortunate that the Babylonians at an early period of their history adopted for the purpose of receiving their inscriptions small cakes of clay varying in size from a square inch to that of a page or a sheet of note-paper. These clay tablets were, in fact, their paper, and on them, with a wooden style, all their documents were written; which had thus the advantage of being able to resist the atmospheric influences of the damp climate of the country of their production better than the Egyptian papyri or the leather rolls of the Jews. At a certain period, about B.C. 2000, the Babylonians even took the precaution of covering the tablets, after they had been written upon, with a coating of clay, on which the documents were re-written. These are what Assyriologists call case-tablets. A careful study of the tablets of the library of Assur-bani-pal has made it evident that it was chiefly composed of copies made from more ancient originals in the temple-libraries of Chaldæa; the Assyrians, before the closing period of their empire, having been chiefly satisfied to translate the ancient Accadian literature, or to re-edit the contents of Babylonian libraries. The library was evidently founded to prevent the youth of Assyria from going to be taught at Babylon or Borsippa, where they might be subjected to dangerous political influences. Its educational character is shown by the discovery of a number of syllabaries, grammars, dictionaries, and reading-books of Assyrian and Accadian, together with lists of Semitic synonyms—a collection in which lay the germ of comparative philology. Thus the inscriptions found in the royal library of Assur-bani-pal at Nineveh, which first revealed to us the important fact that Assyria was possessed of a most extensive literature, having another than a merely monumental character, also afforded a clear indication that there was a definite system of public instruction in use among the Assyrians. This system, the principal details of which are now accessible to us, was not of native origin; but, like the literature which the kings stored in their temple and palace libraries, was based upon, and indeed almost entirely copied from, the older system of the more southern mother-land of Babylonia.

Before passing in review some of the details of the older system which is now to be studied with astonishing fulness of information derived from works originally belonging to the great libraries of Babylon, it is necessary to ascertain upon what basis the statement rests of the existence of a system of public instruction in Assyria. In the library at Nineveh, which we now know to have been formed in the early part of the seventh century before the Christian era by Esar-haddon or Assur-bani-pal, there were found a number of tablets of an educational character carefully compiled and edited. These tablets were arranged in a series; and this series, again, was so constructed as to offer a progressive sequence to the reading of the student. First and foremost, we have the *syllabaries* or spelling-books which contain the explanations of the most common of the cuneiform characters. The standard tablet-book of this class is known as Syllabary A, and contains the explanations of about two hundred of the most ordinary signs. It is well here to mention that every cuneiform character had a dual use, first as a phonetic and then as an ideogram repre-

senting a whole word; and in this list only the most frequent ideogrammatic and phonetic values are selected. The next works in the series were tablets containing short phrases arranged in the manner of Ollendorf with the old Babylonian or Sumerian in the left-hand column, and the Semitic translation in the other. It is these works which afford evidence of the fact that the tablets were but Assyrian editions of older Babylonian productions. This class of tablets were called *ana itti su*, 'to be with him'; and were companion or hand-books for the student. Tablets of this series have a colophon or title page, as it were, attached to them, which affords important information. Each document is said to be 'like its old copy.' Now, as no tablet of a literary character as distinguished from historical records has been found older than the time of Esar-haddon, or at the earliest of Sennacherib, it is evident that the more ancient editions must have been Babylonian—a circumstance which is still further proved by the statement in some cases that the tablets are like the old tablets of Sumer and Accad, that is, of North and South Babylonia. The facts revealed by the Assyrian tablets are amply substantiated by the discovery of duplicate copies of these works in the libraries at Borsippa and Babylon. A second fact to be learned from these tablets is that the library was for public instruction; for the king states, 'on tablets I wrote, I engraved, I made clear, and for the inspection of my subjects within my palace I placed.' It is evident, therefore, that to understand the system of education in practice in Western Asia in ancient times, we must study the documents of the temple schools of Babylonia. The tablets discovered in the ruins of the ancient cities of Babylonia now very clearly set before us the nature and system of the education in use in that country in early times. From these we learn that all the youth of any station above that of the lowest and poorest were educated in reading and writing at least; and this is substantiated by the variety of the handwritings which are found in the documents of a popular character. An old text-book, dating back from the earliest period of the Babylonian monarchy, gives special information, *inter alia*, upon this subject. It enjoins that when a child is born the father must receive him; and it was by this act that he recognised the relation and the obligations of paternity. When the child had arrived at the proper age, the father was bound to teach him how to read the inscriptions, and to provide him with suitable food and clothing. Contracts and legal documents as early as the twenty-first century before the Christian era, and deeds of the thirteenth and fourteenth centuries, exhibit many varied handwritings; and as the documents become more and more numerous, reaching their most prolific period in the time of Nebuchadnezzar, B.C. 606, and his successors, the evidence of the knowledge of writing becomes most ample. The system we know was that in use to the present day in Oriental schools. Certain standard texts, such as the table of laws, the table of precedents, and certain hymns of the highest class, were copied over and over again by the pupils until they were thoroughly acquired; and many rough copies bear on their surface the marks of the master's corrections. In like manner, tables of kings, short epitomes of history, lists of stars and of the principal gods of the Pantheon, were learned. Attached to all temples were schools corresponding to the *Madrasah* of the mosques of Islam, and presided over by the *talmudai*, or teachers. Most of these edifices were small shrines placed under the protection of Nebo, the Hermes of Chaldæa, who bore the epithet of the Teacher. These small schools were the elementary schools feeding the larger colleges attached to the great temples. In a land where literature held so high a position as in Babylonia, there naturally grew up certain centres of intellectual development. Thus in Borsippa medicine and astronomy were chiefly studied; in Larrak, the Laranchæ of Berosus, a city where the king held his court who sent Memnon to the siege of Troy, mathematics and mensuration were the ruling pursuits; Nipur, known at the present day as Niffer, and to be probably identified with the Calneh of Moses and the Calno of Isaiah, characteristically affected magic and divination; while Cuthah was celebrated for its devotion to the studies of eschatology and philology. The great centre of learning, however, was certainly Borsippa, the site of the important temple of Merodach, which was entirely rebuilt by Nebuchad-

nezzar, and from which a part of our Babylonian educational tablets are derived. It is not only evident that the system of instruction was of a most liberal kind, but it is moreover clear that it was prolonged to a much later period than was formerly imagined: for tablets are found dated as late as B.C. 215, which are copies of older works. The tablets were arranged according to a catalogue, portions of which have been found, and were to be asked for by definite titles and numbers. It is curious to note that this system of cataloguing is the same as that of arranging the Hebrew books by the first word or line, and may have given rise to that mode of arrangement; as also to observe that great attention was paid to the study of precedents in the schools of law—a system which we know to lie at the basis of Talmudic teaching.

China.—China has been civilised and educated from time immemorial, and at the present day it is probable, on the testimony of enlightened and impartial foreigners, that primary education is more widely spread among the male population of the 'Middle Kingdom' than in any other country of the world. The society of thousands of years ago is photographed in the description of a German historian of education, who affirms that in China there is no village so miserable, no hamlet so unpretending, as not to be provided with a school of some kind. The importance of the diffusion of instruction amongst the masses was recognised at a period long anterior to that of Confucius (B.C. 551–479), and a certain system of elementary education prevailed for generations before other nations had awakened to a consciousness of its political and social advantages. Even in the early feudal times the way was open for talent and character to rise from the lower ranks in the social scale, and to be admitted to official employment. The system of competitive examinations was even then casting a shadow before, and although offices and rank were not attainable in the same manner as they afterwards came to be, yet magistrates and noblemen considered it necessary to have a sound acquaintance with their ancient writings. It is said in the *Lî Kî*, or *Book of Rites* (about B.C. 1200), 'that, for purposes of education amongst the ancients, villages had their schools, districts their academies, departments their colleges, and principalities their universities.' This, so far as can be ascertained, was altogether superior to what obtained among the Jews, Persians, and Syrians of the same period.

Towards the sixth century B.C. two reformers appeared in China, Lâo-tsze and Khung-tsze, or Confucius. According to the legends attaching to his name, Lâo-tsze, the founder of the sect of the Rationalists of China and other regions of the far East, and of the system of Taoism—the system of the Path or Road, of Reason or Doctrine—was born B.C. 604, more than half a century before the birth of Confucius. He was the representative of the spirit of emancipation, of progress, of the pursuit of the ideal, and of protest against routine and the tyranny of custom. He was an ardent and enlightened advocate of popular education. 'Certain bad rulers,' he said, 'would have us believe that the heart and the spirit of man should be left empty, but that instead his stomach should be filled; that his bones should be strengthened rather than the power of his will; that we should always desire to have the people remain in a state of ignorance, for then their demands would be few. It is difficult, they say, to govern a people that are too wise. These doctrines are directly opposed to what is due to humanity. Those in authority should come to the aid of the people by means of oral and written instruction; so far from oppressing them and treating them as slaves, they should do them good in every possible way.' In other words, it is by enlightening the people and by an honest devotion to their interests, that a ruler becomes worthy to govern them. The career of Lâo-tsze was comparatively a failure, or a mere *succès d'estime*; for his nominal adherents have long since, for the most part, degraded into the lowest idolatry, and the priests of his system into jugglers and necromancers, among whom scarcely a trace of the pure spirit of their master can be discovered.

The fate of Confucius, the younger contemporary of Lâo-tsze, the apostle of the idea of practical utilitarian morality, founded upon the authority of the State and that of the family, as well as upon the interest of the individual, to whom tradition ascribes more than three thousand personal disciples, has been happier in the actual potency of his principles, and in the extent and perduration of their authority and acceptance. Confucius, indeed, ha

enjoyed a continued renown, an ever-repeated triumph, more extended than any other member of the human race. Through all the changes of Chinese dynasties, by whatever causes brought about, his descendants have received peculiar honours. At this day they number more than eleven thousand males, and are said to constitute the only hereditary nobility in China. From his own time to the present the writings of Confucius have been the principal objects of study in all the schools of that vast empire. It has, however, been observed, not unjustly, that the aim and scope of the Confucian philosophy were limited to the present life, and none of his sayings indicate that he had any definite belief in a continued existence after death. His life and teachings tended to the promotion of the useful and practical only; and combined—even after an admiring allowance is made for his beautiful conception of filial piety—to form the expression of an elevated and refined secularism.

The formal institution of the competitive examinations which have been from age to age so nearly omnipotent in their influence on Chinese life and society, and a predetermination to which may be detected in the national institutions many centuries before, took place about A.D. 600, when Taitsung, of the Tang dynasty, established the still existing plan of preparing and selecting the servants of the State by means of study and degrees, founding his system on the facts that education had always been esteemed, and that the ancient writings were accepted by all as the best instructors of the manners and tastes of the people. Centralisation and conservatism were the leading features in the teachings of Confucius which first recommended them to the rulers, and have decided the course of public examinations in selecting officers who would readily uphold these principles. The effect has been that the literary class in China has uniformly held the functions of both nobles and priests, a perpetual association, *gens æterna in quâ nemo nascitur*, holding in its hands public opinion and the legal power to maintain it. The geographical isolation of the people, the nature of the language, which is regarded as the most difficult known to the speech of articulating men, and the absence of a landed aristocracy, combined to add efficiency to the system.

Dr. Martin exhibits the safeguards of this competitive system, the incidental advantages of which may be comprehended under three heads. In the first place, it served the State as a safety-valve, providing a career for those ambitious spirits who might otherwise foment disturbances or excite revolutions; in the second place, it operates—or operated, for in the history of a country like China, where traditions, once established, survive for ever, the past and present are nearly convertible—as a counterpoise to the power of an absolute monarchy, as without it the great offices would be filled by hereditary nobles, and the minor offices would be farmed out by thousands to imperial favourites; and thirdly, it gives the Government a hold on the educated gentry, and binds them to the support of existing institutions, whilst at the same time it renders the literary class eminently conservative.

Education, as the only high road to place, honour, and emolument, has always been, in consequence, largely sought after by all who were desirous of following an official career; while the universal respect for letters has encouraged all of every degree to gain at least a smattering of learning—except the women, upon whom no prospects of office, the reward of literary distinction, have ever smiled.

Hitherto, therefore, very little trouble has been taken with regard to the education of girls, from whom little more was to be required than that they should be good needlewomen and expert cooks, and that they should learn to act modestly, and to show due deference to their superiors. With the men the case was different indeed, for as no one could hold any State preferment unless he had passed the first of the three great literary competitive examinations, the whole education of boys was arranged with the object of enabling them to pass successively through these ordeals. Unfortunately for the real education of the aspirants to office, the only subject required of them was, as it still is, a knowledge of the Nine Classics, concluding with the *Shih King*, or *Book of Odes*, and the *Lî Kî*, or *Book of Rites*—the *ultima Thule* of Chinese learning. The result is that from childhood upwards these works are the only text-books which are put into the hands of Chinese schoolboys. These they are taught to regard as the supreme models of excellence, and any deviation, either from the opinions they contain or

from the style in which they are written, would be looked upon as heretical. Year after year these form the subjects of the study of every aspiring scholar, until every character and every phrase is, or should be, indelibly engraved on the memory. This course of instruction has been exactly followed in every school in the empire for many centuries, and the result is that there are annually turned out a vast number of lads all cast in the same mould, all possessed of a certain amount of ready-made knowledge, and with their memories unduly exercised at the expense of their thinking powers. The minds of the scholars are not symmetrically trained, and they are encouraged superciliously to disparage all requirements which are not of direct utility to their advancement as candidates and place-holders. China has produced generation after generation of men who have learned to elevate mere memory above genius, and whose intellectual faculties have been damaged by servile imitation, and by the paltry literalism of the schools.

It is a corollary from the veneration paid to learning in all the stages of Chinese history, that the person and the vocation of the teacher have been proportionately venerable. Boys commenced their studies at the age of seven with a teacher; for, even if the father were a literary man, he seldom instructed his sons, and very few mothers were able to teach their offspring to read. One of the most authoritative treatises for the guidance of teachers, when establishing the elements of education, advises fathers to choose from among their concubines those who are fit for nurses, seeking such as are mild, indulgent, affectionate, benevolent, cheerful, kind, dignified, respectful, and reserved and careful in their conversation, whom they will make governesses over their children. The treatise in question is the *Nei-tsze*, forming the tenth book of the *Lî Kî*, and its title, which means the *Pattern of the Family*, is given to it, as Kang Hsüan says, because it records the rules for sons and daughters in serving their parents, and for sons and th vives in serving their parents-in-law in the family home. Among the other treatises of the *Lî Kî* it may thus be differenced as giving the rules for children. And because the observances of the harem are worthy of imitation, it is called the *Pattern of the Interior*. Kû Hsî says that 'it is a book which was taught to the people in the ancient schools, an ancient classic or sacred text.' After giving the directions about the selection of a likely nurse for an expected infant, the *Nei-tsze* proceeds, in the form of a didactic narrative, to give other directions. 'When the child,' it says, 'was able to take its own food it was taught to use the right hand. When it was able to speak, a boy was taught to respond boldly and clearly; a girl, submissively and low. The former was fitted with a girdle of leather, the latter with one of silk. At six years, they were taught the numbers and the names of the cardinal points; at the age of seven, boys and girls did not occupy the same mat nor eat together; at eight, when going out or coming in at a gate or door, and going to their mats to eat and drink, they were required to follow their elders:—the teaching of yielding to others was now begun; at nine, they were taught how to number the days. At ten, (the boy) went to a master outside, and stayed with him (even) over the night. He learned the (different classes of) characters and calculation; he did not wear his jacket or trousers of silk; in his manners he followed his early lessons; morning and evening he learned the behaviour of a youth; he would ask to be exercised in (reading) the tablets, and in the forms of polite conversation. At thirteen, he learned music, and to repeat the odes, and to dance the Ko (of the duke of Kâu).[1] When a full-grown lad, he danced the hsiang (of King Wû). He learned archery and chariot-driving. At twenty, he was capped, and first learned the (different classes of) ceremonies, and might wear furs and silk. He danced the tâ hsiâ (of Yü), and attended sedulously to filial and fraternal duties. He might become very learned, but did not teach others;—(his object being still) to receive and not to give out. At thirty, he had a wife, and began to attend to the business proper to a man. He extended his learning, without confining it to particular subjects. He was deferential to his friends, having regard to the aims (which they displayed). At forty, he was first appointed to office, and according to the business of it brought out his plans

[1] It is difficult to describe exactly, amid the conflict of different views, these several dances. Dances were of two kinds, the civil and military. The Ko was perhaps the first of the civil dances, ascribed to the duke of Kâu; and the hsiang, the first of the martial. The two are said to have been combined in the tâ hsiâ.

and communicated his thoughts. If the ways (which he proposed) were suitable, he followed them out; if they were not, he abandoned them. At fifty, he was appointed a great officer, and laboured in the administration of his department. At seventy he retired from his duties. In all salutations of males, the upper place was given to the left hand.

'A girl at the age of ten ceased to go out (from the women's apartments). Her governess taught her (the arts of) pleasing speech and manners, to be docile and obedient, to handle the hempen fibres, to deal with the cocoons, to weave silks and form fillets, to learn (all) woman's work, how to furnish garments, to watch the sacrifices, to supply the liquors and sauces, to fill the various stands and dishes with pickle and brine, and to assist in setting forth the appurtenances for the ceremonies. At fifteen, she assumed the hair-pin; at twenty, she was married, or, if there were occasion for the delay, at twenty-three. If there were the betrothal rites, she became a wife; and if she went without these, a concubine. In all salutations of females the upper place was given to the right hand.'

With reference to the numbering of the days, in which children were instructed at nine years of age, Dr. Legge observes that 'to number the days was, and is, a more complicated affair in China than in this country, requiring an acquaintance with all the terms of the cycle of sixty, as well as the more compendious method by decades for each month.' With reference to what is enjoined as to the education of girls, Dr. Legge remarks that 'there is nothing in what is said of the daughters to indicate that they received any literary training. They were taught simply the household duties that would devolve on them in their station in society; though among them, be it observed, were the forms and provision for sacrifice and worship. It will be observed, also, at how early an age all close intercourse between them and their brothers came to an end, and that at ten they ceased to go out from the women's apartments.' That this withholding of literary culture from the education of women was not felt by the sex universally as a hardship or an injustice, is shown on the authority of Pan-Hwui-pan, also known as Pan-Chao, perhaps the most celebrated female writer of China, who flourished in the first century of the Christian era, and who devoted her life and talents to the elevation of the character and position of women, and to their advancement in all the virtues. 'The virtue of a female,' says this accomplished lady, 'does not consist altogether in extraordinary abilities or intelligence, but in being modestly grave and inviolably chaste, observing the requirements of virtuous widowhood, and in being tidy in her person and everything about her; in whatever she does to be unassuming, and whenever she moves or sits to be decorous. This is female virtue.' On the whole it may be concluded, with the slight necessary reserve, with Professor Compayré, that at every period of her long history China 'has preserved her national peculiarities. For more than three thousand years an absolute uniformity has characterised this immobile people. Everything is regulated by tradition. Education is mechanical and formal. The pre-occupation of teachers is to cause their pupils to acquire a mechanical ability, a regular and sure routine. They care more for appearances, for a decorous manner of conduct, than for a searching and profound morality. Life is but a ceremonial, minutely determined and punctually followed. There is no liberty, no glow of spontaneity. Their art is characterised by conventional refinement, and by a prettiness that seems mean; there is nothing of the grand or imposing. By their formalism, the Chinese educators are the Jesuits of the East.'

Egypt.—It is one of the marvels of Egypt and its early civilisation, that it starts already full grown into life in the valley of the Nile, as a nation highly advanced in language, painting, and sculpture, and offers the enigma as to whence it attained so high a point of development. There is no monumental nation which can compare with it for antiquity, except perhaps Babylonia; and evidence is yet required to determine which of the two empires is the older. The arts of Egypt exercised an all-powerful influence on the ancient world. The Phœnicians copied their types, and Greece adopted the early Oriental style of architecture, for the Doric style came from Egypt, the Ionic from Assyria, the later Corinthian again from Egypt. If Phœnicia conferred an alphabet on Greece, Egypt suggested the use of such characters to Phœnicia. Already in

the seventh century B.C., the hieroglyphs represented a dead form of the Egyptian language, one which had ceased to be spoken; and Egyptians introduced a conventional mode of writing simpler than the older forms, and better adapted for the purposes of vernacular idiom. Egyptian philosophy, the transmigration doctrine of Pythagoras, that of the immortality of the soul of Plato, pervaded the Hellenic mind from the colleges of Thebes. The wisdom of the Egyptians was embodied in ethical works of proverbs and maxims as old as the Pyramids, and as venerable for their hoar antiquity as the days of the Exodus. The frail papyrus, the living rock, the temple, and the tomb, have all preserved an extent of literature found nowhere else. The motive was a religion which looked forward to an eternal duration, or the return of the past to the future. The national psalm of Pentaur is found on the walls of Thebes, and the papyrus of Sallier. The *Book of the Dead* was alike sculptured on the tombs and written on the roll; it embodied much of the symbolic, though less of the esoteric, doctrine. The Elysian fields, the streams of Styx, burning Phlegethon, the judges of the dead, are Egyptian conceptions; the sun-worship is Egyptian; medicine and astronomy, geometry, truthful history, and romantic fictions are found in the extensive literature. Many dogmas and practices of an Egyptian origin have descended to the present day, and exercise more influence than is generally supposed on modern religious thought.

The schools of Egypt, like those of Judea, were ecclesiastical; but whilst the Jews had but little effect on the progress of science, the obligations of the rest of the world to the priests of the Nile Valley were, as has just been indicated, more than considerable. Much of their learning is obscure to us, and their methods of instruction, in spite of the fairly rewarded efforts of recent inquirers, and especially those of Professor Georg Ebers, who in his learned romances, and otherwise, has sought to realise and to reproduce the student life of the temple-schools of the country, are to a provoking extent still unascertained. Sufficient is known, however, to justify the reasonable conclusion of scholars, as stated by Mr. Oscar Browning, that 'there is no branch of science in which they did not progress at least so far as observation and careful registration of facts could carry them. They were a source of enlightenment to surrounding nations. Not only the great lawgiver of the Jews, but those who were most active in stimulating the nascent energies of Hellas, were careful to train themselves in the wisdom of the Egyptians. Greece, in giving an undying name to the literature of Alexandria, was only repaying the debt which she had incurred centuries before.'

In the dearth of details as to the actual methods of imparting instruction in a country the reputation of whose learning is as extended as it is perennial, every glimpse which can be gained is precious beyond what would otherwise be its proportionate value. Such a glimpse is afforded in the *Maxims of Ani*, one of the several collections of precepts and maxims on the conduct of life which have descended to this generation from what is colourably the remotest antiquity which can be approached within the limits of the literature or civilisation of mankind. Of these collections are the *Maxims* of Ptahhotep contained in the Prisse Papyrus, the *Instructions* of Amenemhat, and the *Maxims* of Ani, just mentioned; whilst fragments of other important works are preserved in the museums of Paris, Leyden, and St. Petersburg. The most venerable of them is the work of Ptahhotep, which dates from the age of the Pyramids, and yet appeals to the authority of the ancients. It is almost certainly, as M. Chabas called it, in the title of the memorable essay in which its contents were first made known (*Revue Archéologique*, 1857), 'le plus ancien livre du monde.' The manuscript at Paris which contains it was written centuries before the Hebrew lawgiver was born; but the author of the work lived as far back as the reign of King Assa Tatkara of the fifth dynasty. The *Maxims* of Ani, in the matter of antiquity, may be said to rank with, but after the collection of Ptahhotep; and they comprise a section upon maternal love, which describes the self-sacrifice of an affectionate mother from the earliest moments of the child's existence, and continues as follows:—'Thou wast put to school, and whilst thou wast being taught letters she came punctually to thy master, bringing thee the bread and the drink of her house. Thou art now come to man's estate; thou art married

and hast a house; but never do thou forget the painful labour which thy mother endured, nor all the salutary care which she has taken of thee. Take heed lest she have cause to complain of thee, for fear that she should raise her hands to God, and He should listen to her prayer.'

The social restrictions and disabilities, which less or more prevailed amongst the most cultured nations of antiquity, have been recently shown not to have attached in any purely prohibitive degree to the liberal and aspiring youth of Egypt. Until lately it was believed without reserve, and asserted without misgiving, that, while of all the Oriental nations Egypt is the one in which intellectual achievement seems to have reached its highest point, the attainment of scientific eminence, with the rewards of official distinction, authority, and emolument which scientific eminence involved, was limited to persons only of a favoured class and of high hereditary function. The hierarchy was supposed not merely to have appropriated, but to have monopolised, the learning of the day, and to have jealously guarded from vulgar intrusion the stores of the mysterious knowledge which was communicated or communicable only to the sovereign and the nobility. The common people, who were by the same hypothesis inevitably destined from father to son to an identical social status, learned scarcely more than was necessary in order to practise their ancestral trades or handicrafts, and to be initiated into the religious beliefs which became their station. More happily conducted researches into the subject, however, have practically demonstrated the fact that the hereditary tendency, which, without doubt, powerfully existed, to the adoption by the son of the paternal calling, was so susceptible of modification or solution as to be frequently inoperative —so frequently, indeed, as to invalidate the long-current accusation. Dr. Heinrich Brugsch-Bey has some vivid and suggestive words with regard to the elasticity and generosity, in this respect, of ancient Egyptian institutions:—'In the schools where the poor scribe's child sat on the same bench beside the offspring of the rich, to be trained in discipline and wise learning, the masters knew how by timely words to goad on the lagging diligence of the ambitious scholars, holding out to them the future reward which awaited youths skilled in knowledge and letters. Thus the slumbering spark of self-esteem was stirred to a flame in the youthful breast, and emulation was stimulated among the boys. Even the clever son of the poor man might hope by his knowledge to climb the ladder of the higher offices, for neither his birth nor position in life raised any barrier, if only the youth's mental power justified fair hopes for the future. In this sense the restraints of caste did not exist, and neither descent nor family hampered the rising career of the clever. Many a monument consecrated to the memory of some nobleman gone to his long home, who during life had held high rank at the court of Pharaoh, is decorated with the simple but laudatory inscription, "His ancestors were unknown people." It is a satisfaction to avow that the training and instruction of the young interested the Egyptians in the highest degree. For they fully recognised in this the sole means of elevating their national life, and of fulfilling the high civilising mission which Providence seemed to have placed in their hands. But above all things they regarded justice, and virtue had the highest value in their eyes. The law which ordered them "to pray to the gods, to honour the dead, to give bread to the hungry, water to the thirsty, clothing to the naked," reveals to us one of the finest qualities of the old Egyptian character, pity towards the unfortunate. The forty-two commandments of the Egyptian religion which are contained in the 125th chapter of the *Book of the Dead*, are in no way inferior to the precepts of Christianity; and, in reading the old Egyptian inscriptions concerning morality and the fear of God, we are tempted to believe that the Jewish lawgiver Moses modelled his teachings on the patterns given by the old Egyptian sages.'

In another connection Brugsch-Bey carries his optimism with reference to the affairs of Egypt to the extent of posing as an apologist for the misrepresented Cambyses, whom he couples with Darius I. as being benevolently disposed towards the interests of Egyptian education. In one of the inscriptions he records that 'Cambyses appears in a totally different light from that in which school-learning places him. He takes care for the gods and their temples, and has himself crowned

in Saïs after the old Egyptian manner. Darius I., whom the Egyptian Uza-hor-en-pi-ris had accompanied to Elam (Elymaïs), took particular pleasure in rescuing the Egyptian temple-learning from its threatened extinction. He provided for the training of the energetic and gifted youth in the schools of the priests, to be the future maintainers and teachers of the lost wisdom of the Egyptians.'

The question of the existence of caste—varying, as it may do, from an iron and unbending tyranny to an expediency so unpretentious as scarcely to assert, or even to seek, a sanction external to itself—is of such vital and characteristic importance in the working of any system of education that it is convenient in this connection to quote the judicial generalisation of one of our most trusted masters in Egyptology.

'As long,' says M. P. Le Page Renouf, 'as our information depended upon the classical Greek authors, the existence of castes among the Egyptians was admitted as certain. The error was detected as soon as the sense of the inscriptions could be made out. A very slight knowledge of the language was sufficient to demonstrate the truth to the late M. Ampère. Among ourselves many men may be found whose ancestors have for several generations followed the same calling, either the army or the Church, or some branch of industry or trade. The Egyptians were no doubt even more conservative than ourselves in this respect. But there was no impassable barrier between two professions. The son or the brother of a warrior might be a priest. It was perhaps more difficult to rise in the world than it is with us; but a man of education, a scribe, was eligible to any office, civil, military, or sacerdotal, to which his talents or the chances of fortune might lead him, and nothing prevented his marriage with the daughter of a man of a different profession.'

Not less interesting are the words of the Rev. Canon Rawlinson, in regard to the chances open to youth of talent irrespective of their social position, words which lose nothing of their weight because they manifest some hesitation in accepting as proved the position which Brugsch-Bey has so uncompromisingly assumed. Canon Rawlinson introduces the words to which we now directly refer by a passage describing the respect with which the young, with whom was the future, treated the aged, with whom was the past. The consideration shown to age in Egypt was remarkable, and, though perhaps a remnant of antique manners, must be regarded as a point in which their customs were more advanced than those of most ancient peoples. "Their young men, when they met their elders in the street," we are told (Herodotus, ii. 80), "made way for them and stepped aside; and if an old man came in where young men were present, the latter rose from their seats out of respect for him." In arrangements with respect to education, the ancient Egyptians seem also to have attained a point not often reached by the nations of antiquity. If the schools wherein scribes obtained their instruction were really open to all (*see* Brugsch, *Geschichte Aegyptens*, p. 24), and the career of scribe might be pursued by any one, whatever his birth, then it must be said that Egypt, notwithstanding the general rigidity of her institutions, provided an open career for talent such as scarcely existed elsewhere in the old world, and such as few modern communities can be said even yet to furnish. It was always possible, under despotic governments, that the capricious favour of the sovereign should raise to a high, or even to the highest, position the lowest person in the kingdom. But in Egypt alone, of all ancient States, does a system seem to have been established whereby persons of all ranks, even the lowest, were invited to compete for the royal favour, and, by distinguishing themselves in the public schools, to establish a claim for employment in the public service. That employment once obtained, their future depended on themselves. Merit secured promotion; and it would seem that the efficient scribe had only to show himself superior to his fellows in order to rise to the highest position but one in the empire.'

Greece.—*See* Athenian Education, and Lacædemonian Education.

India.—Hindu civilisation may be said to have changed so little in the course of ages that if an ancestor of a thousand years ago could visit a descendant of the thirtieth degree, there would not be much to suggest to either a wider secular chasm than if one had followed the other in the way of direct and immediate succession. For as soon as we look below the surface, as soon as we pass from the large towns to the country, it is found that the cur-

rent of Hindu life and manners has been but slightly affected by Western influence. The upper crust of society may have altered, but the movement has scarcely penetrated to the great mass below. English law and English customs are, no doubt, gradually working a change, but generations will have to pass before the change will have penetrated very deeply. Even railways have failed to produce more than a superficial effect, and the majority of the most highly 'Europeanised' of the natives still cling to the system of caste. This last alone is sufficient to account for the still deathless perpetuation of customs in general, and of educational subjects and matters in particular, alongside of the aggressive vigour of foreign institutions which have been introduced into the Indian system on the principle of inoculation rather than that of incorporation.

The indigenous culture of India goes back to a period when the Greeks had not yet entered upon their heroic age; and it is possible to trace its origin and growth, with the aid of contemporaneous literature, almost from the fifteenth century before the Christian era. This, at least, is the probable date of that wonderful collection of hymns known as the Veda, or, more strictly, the Rig-Veda, which constitutes the oldest literary monument of the great Aryan race. Some of the poems, indeed, are later than others; but the whole collection cannot well be regarded as less than three thousand years old. It is upon this ancient collection of poems that Hindu civilisation rests; it forms the starting-point not only of Hindu theology, but of Hindu philosophy, Hindu law, and Hindu art and science as well. To understand the Rig-Veda is to understand the history of Hindu thought and civilisation. But the language, as well as the life and belief, of the Hindu has changed more than once since the times when the hymns of the Rig-Veda were composed. They are written in an archaic form of Sanskrit, which differs very considerably from the classical Sanskrit of a later period both in vocabulary and in grammar. It brings us nearer to the common Aryan language spoken by the ancestors of the Hindus and the Persians, of the Greeks and the Italians, of the Slavs and the Celts, before they set out on their long wanderings. It is true that a traditional interpretation of the hymns has been handed down along with the hymns themselves, and that, four or five centuries before the Christian era, the more obscure words and forms had been discussed in treatises which display the most profound acquaintance with the principles of phonology and grammar; but it is also true that the tradition is not uniformly correct, and that the real force and meaning of much of the Vedic language can only be discovered by a minute examination of the text, and the assistance of comparative philology. One of the most important of the Hindu writings for purely linguistic purposes is the *Prâtisâkhya* of Saunaka, a treatise on Vedic phonology, which seems to be as old as the fifth century B.C. This particular *Prâtisâkhya* is only one out of many which once existed, and were designed to preserve the pronunciation of the sacred hymns from being corrupted. The practical aim, however, is attained by means of a marvellously minute and accurate investigation of phonetic utterance; indeed, so thoroughly scientific is the analysis and classification of sounds as to have been made the basis of modern researches into phonology.

Considering that the education of India was effected in, by, and for the Vedas, and that its primary and ultimate aim was their safe transmission, a few words of more particular description of these sacred books may here be profitably supplied. The Veda, or knowledge, was invested with divine authority; its mere words, apart from any meaning they might convey, were believed to have a religious efficacy, and the theory of inspiration invented to support their sacred character goes much beyond the most extreme theory of verbal inspiration ever held in the Christian or the Jewish Church. The Rig-Veda, or Veda of Praise, which contains prayers and hymns in verse, had to share its place of honour with three other collections, two of which, the Yajur-Veda and the Sâma-Veda, contain little besides what is found in the Rig-Veda. They are, in fact, only prayer-books compiled from the older collection of hymns, and were intended for the use of choristers and ministers of the priests at the sacrifices, just as the Rig-Veda was assigned to the Hotri, or the priest proper. The fourth, or Atharva-Veda, is of later origin

than the rest, which were peculiarly termed the Trayî, or Triad, and consists of a number of poems mixed up with popular sayings, medical advice, magical formulæ, and the like. In process of time, commentaries on the Vedas were called into existence, on which, under the title of Brâhmanas, the sacredness of the Vedas came to be reflected: so that they also, in the long run, began to be regarded as authoritative, and to be superseded in their original ancillary position by the Sûtras, the 'Strings' or manuals of the grammarians. It is to this, the Alexandrine age of the Hindu literature, that the Prâtisâkhyas, already referred to, belong; and the results of the labours of the period are truly astonishing. Not only were the very syllables of the Rig-Veda counted with absolute accuracy, and lists of obsolete words and synonyms drawn up, but one of the most perfect systems of phonology and grammar ever known was elaborated—a system which has been taken as the foundation of the scientific grammatical investigations of our own day. Grammar, or Vyâkarana, however, was only one of the six Vedângas, or branches of Vedic doctrine, that were studied, and which comprised also Siksha (pronunciation), Chhandas (metre), Nirukta (explanation of words), Jyotisha (astronomy), and Kalpa (ceremonial). Indeed, all the other subjects of inquiry were but subsidiary to the last; it was to prevent mistakes being made in the performance of divine worship, and to preserve the Key of Knowledge, sacred and profane, in the jealous keeping of a learned priestly caste that both Vedas and Brâhmanas were so closely investigated.

The ultimate aim, then, of Hindu education—to repeat more emphatically what has already been incidentally mentioned—was to produce mnemonic custodians of the Vedas, and of other sacred books in the order of their production, who should ensure, by the power of mutual checks, the purity and integrity of the treasures committed to them, whether by oral or literary transmission. This exact and perfect memory of sacred words and sacred things was all the more necessary in the ages that preceded the art of writing, of which there is no evidence that it was known in India much before the beginning of Buddhism, or the very end of the ancient Vedic literature. From the earliest times, as far back as we know anything of India, we find that the years which we spend at school and the university, were spent by the sons of the higher classes in acquiring, from the mouth of a teacher, their sacred learning. This was a solemn duty, the neglect of which entailed social degradation, and the most minute rules were laid down as to the mnemonic systems that had to be followed. Before the invention of writing, there was, indeed, no other way of preserving literature, whether sacred or profane; and, in consequence, every precaution was taken against accidents. 'Those Brahmans,' says Professor Max Müller, 'who even in this Kali age, and during the ascendency of the Mlekkhas, uphold the sacred traditions of the past, are not to be met with in the drawing-rooms of Calcutta. They depend on the alms of the people, and live in villages, either by themselves, or in colleges. These men, and I know it as a fact, know the whole Rig-Veda by heart, just as their ancestors did, three or four thousand years ago; and though they have MSS., and though they have now a printed text, they do not learn their sacred lore from them. They learn it, as their ancestors learnt it thousands of years ago, from the mouth of a teacher, so that the Vedic succession should never be broken. The oral teaching and learning become, in the eyes of the Brahmans, one of the "Great Sacrifices," and though the number of those who still keep it up is smaller than it used to be, their influence, their position, their sacred authority are as great as ever.' To the same effect the editor of the *Indian Antiquary*, writing in 1878, says that, 'there are thousands of Brahmans who know the Rig-Veda by heart, and can repeat it in Sanhitâ, Pada, Jatâ, Ghana, and Krama, without making any mistakes'—the Sanhitâ and others being five different methods of learning the Veda, by either reciting each word separately, or by repeating the words in various complicated ways. The Rig-Veda, it may be stated, consists of 1,017 or 1,028 hymns, each on an average of ten verses. The total number of words, if we may trust native scholars, amounts to 153,826. 'They,' says Professor Max Müller, meaning the Vedic students of the present time, which also includes all time, even to the remotest antiquity—'they learn a few lines every day, repeat them for-

hours, so that the whole house resounds with the noise, and they thus strengthen their memory to that degree that, when their apprenticeship is finished, you can open them like a book, and find any passage you like, any word, any accent.' Professor Max Müller proceeds to picture a 'half-naked Hindu repeating under an Indian sky the sacred hymns which have been handed down for three or four thousand years by oral tradition. If writing had never been invented, if India had never been occupied by England, that young Brahman, and thousands and thousands of his countrymen, would probably have been engaged just the same in learning and saying by heart the simple prayers first uttered on the Sarasvatî and the other rivers of the Penjab by Vasishtha, Visvâmitra, Syâvâsva, and others.'

The method of oral teaching followed in the schools of ancient India is carefully described in the fifteenth chapter of the Prâtisâkhya of the Rig-Veda, that is, probably, in the fifth or sixth century B.C. It is constantly alluded to in the Brahmanas, but it must have existed even during the earlier period, for in one of the hymns of the Rig Veda, in which the return of the rainy season, and the delight and croaking of frogs are described, we read:—'One repeats the speech of the other, as the pupil repeats the words of the teacher.' In the description of the method of oral teaching in the Prâtisâkhya in question, 'the teacher, we are told, must himself have passed through the recognised curriculum, and have fulfilled all the duties of a Brahmanical student (brahmakârin), before he is allowed to become a teacher, and he must teach such students only as submit to all the rules of studentship. He should settle down in a proper place. If he has only one pupil or two, they should sit on his right side; if more, they must sit as there is room for them. At the beginning of each lecture the pupils embrace the feet of their teacher and say, "Read, Sir." The teacher answers, "Om, Yes," and then pronounces two words, or, if it is a compound, one. When the teacher has pronounced one word or two, the first pupil repeats the first word, but if there is anything that requires explanation, the pupil says "Sir;" and after it has been explained to him (the teacher says), "Om, Yes, Sir."

'In this manner they go on till they have finished a prasna (question), which consists of three verses, or, if they are verses of more than forty to forty-two syllables, of two verses. If they are pankti-verses of forty to forty-two syllables each, a prasna may comprise either two or three; and if a hymn consists of one verse only, that is supposed to form a prasna. After the prasna is finished, they have all to repeat it once more, and then to go on learning it by heart, pronouncing every syllable with the high accent. After the teacher has first told a prasna to his pupil on the right, the others go round him to the right, and this goes on till the whole adhyâya or lecture is finished: a lecture consisting generally of sixty prasnas. At the end of the last half-verse the teacher says, "Sir," and the pupil replies, "Om, Yes, Sir," repeating all the verses required at the end of a lecture. The pupils then embrace the feet of their teacher, and are dismissed.' These are the general features of a lesson, but the Prâtisâkhya contains some minute rules besides. For instance, in order to prevent small words from being neglected, the teacher is to repeat twice every word which has but one high accent, or consists of one vowel only. A number of small words are to be followed by the particle 'iti,' thus, others are to be followed by iti, and then to be repeated again, e.g. ka-iti ka. These lectures continued during about half the year, the term beginning generally with the rainy season. There were, however, many holidays on which no lectures were given; and on these points also the most minute regulations are given both in the Grihya and Dharma-sûtras.

The syllable 'Om,' which occupies so prominent a position in the conversation which is prescribed between pupil and Guru, or teacher, as a preliminary and a concomitant of Vedic instruction, is defined as being 'the door of heaven. Therefore,' says Âpastamba, representatively for himself and other commentators on the Sacred Laws, 'he who is about to study the Veda shall begin (his lesson) by (pronouncing) it. If he has spoken anything else (than what refers to the lesson) he shall resume his reading by repeating the word "Om." Thus the Veda is separated from profane speech. And at sacrifices the orders (given to the priests) are headed by this word. And in common life, at the occasion of

ceremonies performed for the sake of welfare, the sentences shall be headed by this word, as, for instance, "(Om) an auspicious day," "(Om) welfare," "(Om) prosperity." Without a vow of obedience (a pupil) shall not study (nor a teacher teach) a difficult (new book) with the exception of (the texts called) Trihsrâvana and Trihsahavakana.'

There are several series of canons still extant which were formulated by various sages of old to regulate the *status* of studentship. These, as exemplified in the *Institutes of Vishnu*, enjoin that students, after initiation—a rite, ceremony, or sacrament, which, in the case of Brâhmanas, should take place 'in the eighth year after conception,' and must not be delayed beyond the sixteenth year—should dwell at the house of their Guru, or spiritual teacher. They must recite their morning and evening prayers, and each student 'shall mutter the morning prayer standing, and the evening prayer sitting.' Twice a day he is to perform the religious acts of sprinkling the ground (round the altar) and of putting fuel on the fire. 'He must plunge into the waters like a stick,' and is to study when called upon to do so by his teacher, to whom he is to be serviceable in every respect. The institutes proceed to regulate the garments and the diet of the student; to restrict and define his mendicancy, and to prescribe the acts of courtesy and reverence he is to render to his teacher, whom, whether in gait, manner, speech, or any other particular, he is forbidden to mimic, and whose reputation is to be precious to him. In the practice of such exercises the student is to 'acquire by heart one Veda, or two Vedas, or (all) the Vedas. Thereupon, the Vedângas (that treating of phonetics and the rest). He who, not having studied the Veda, applies himself to another study, will degrade himself, and his progeny with him, to the state of a Sûdra. From the mother is the first birth; the second, from the girding with the sacrificial string. In the latter the Sâvitrî hymn is his mother, and the teacher his father. It is this which entitles members of the three higher castes to the designation of the "twice-born." Previous to his being girded with the sacrificial string a member of these castes is similar to a Sûdra (and not allowed to study the Veda). . . A Brâhmana who passes without tiring (of the discharge of his duties) the time of his studentship will attain to the most exalted heavenly abode (that of Brahman) after his death, and will not be born again in this world.' A Guru must not admit to his teaching one whom he does not know; neither may he initiate such a one. 'If by instructing a pupil neither religious merit nor wealth is acquired, and if no sufficient attention is to be obtained from him (for his teacher's words), in such soil divine knowledge must not be sown: it would perish like fine seed in barren soil. The deity of sacred knowledge approached a Brâhmana (and said to him), "Preserve me, I am thy treasure, reveal me not to a scorner, nor to a wicked man, nor to one of uncontrolled passions: thus I shall be strong. Reveal me to him, as to a keeper of thy gem, O Brâhmana, whom thou shalt know to be pure, attentive, possessed of a good memory, and chaste, who will not grieve thee, nor revile thee."' The *Institutes* go on to prescribe conditions, sometimes fantastic, under which the pupil may *not* study. 'Let him avoid studying at times when there ought to be an intermission of study, even though a question has been put to him (by his teacher);' a regulation which is especially to be understood by remembering that every lesson consisted of questions put by the teacher and the student's answer to them. The sanction of this solution of the habit and course of study is based on the circumstance that to study on forbidden days does not advantage any one in this or in the other world, and that, indeed, to study on such days destroys the life of both teacher and pupil. 'Therefore should a teacher, who wishes to obtain the world of Brahman, avoid improper days, and sow (on proper days) the seed of sacred knowledge on soil consisting of virtuous pupils.' It would be difficult to conceive of a more exalted estimate of the vocation of the Guru—of which the injunctions for the student to embrace his feet on all suitable occasions, and to perform other acts of service and veneration, are ordinary expressions—than is contained in the following verses of the *Institutes*, which place the teacher, once for all, on the most elevated plane of dignity which it is possible for one human being to occupy in relation to another. 'Let (a student) never grieve that man from whom he has obtained worldly knowledge (relating to poetry,

rhetoric, and the like subjects), sacred knowledge (relating to the Vedas and Vedângas), or knowledge of the Supreme Spirit. Of the natural progenitor and the teacher who imparts the Veda to him, the giver of the Veda is the more venerable father; for it is the new existence acquired by his initiation in the Veda which will last him both in this life and the next. Let him consider as a merely human existence that which he owes to his father and mother uniting from carnal desire and to his being born from his mother's womb. That existence which his teacher, who knows all the Vedas, effects for him through the prescribed rites of initiation with (his divine mother) the Gâyatrî, is a true existence; that existence is exempt from age and death. He who fills his ears with holy truths, who frees him from all pain (in this world and the next), and confers immortality (or final liberation) upon him, that man let the student consider as his (true) father and mother: gratefully acknowledging the debt he owes him, he must never grieve him.'

Further light is thrown on the method of the Vedic studies of antiquity, in an interesting account of the state of native learning which appears in the *Indian Antiquary* for May 1874, to which it was contributed, with the title of *The Veda in India*, by Professor Ram Krishna Gopal Bhandarkar. This account is to the effect that every Brahmanic family is devoted to the study of a particular Veda, and a particular *sâkhâ*, or recension of a Veda; and the domestic rites of a family are performed according to the ritual prescribed in the sûtra connected with that Veda. The study consists in getting by heart the books forming the particular Veda. In Northern India, where the predominant Veda is the *White Yajush*, and the sâkhâ Mâdhyandina, this study has almost died out, except at Banâras, where Brahmanic families from all parts of India are settled.

'It prevails to some extent in Gujarât, but to a much greater extent in the Marâthâ country, and in Tailangana there is a large number of Brahmans who still devote their life to this study. Numbers of these go about to all parts of the country in search of *dakshinâ* (fee, alms), and all well-to-do natives patronise them according to their means, by getting them to repeat portions of their Veda, which is mostly the *Black Yajush*, with *Âpastamba* for their *sûtra*. Hardly a week passes here in Bombay in which no Tailanga Brâhman comes to me to ask for *dakshinâ*. On each occasion I get the men to repeat what they have learned, and compare it with the printed texts in my possession. With reference to their occupation, Brâhmans of each Veda are generally divided into two classes, Grihasthas and Bikshukas. The former devote themselves to a worldly avocation, while the latter spend their time in the study of their sacred books and the practice of their religious rites. Both these classes have to repeat (daily) the *Sandhyâ-Vandana*, or twilight prayers, the forms of which are somewhat different for the different Vedas. But the repetition of the Gâyatrî-mantra *Tat Savitur varenyam*, &c., five, ten, twenty-eight, or a hundred and eight times, which forms the principal portion of the ceremony, is common to all.'

The Vedic learning of the Grihasthas is limited as compared with that of the Bhikshukas, some of whom are what are called Yâjnikas, who follow a priestly occupation and are skilled in the performance of the sacred rites; whilst a more important class still are the Vaidikas, some of whom are Yâjnikas as well. Learning the Vedas by heart, and repeating them in a manner never to make a single mistake, even in the accents, is the occupation of their life. The best Rigvedi Vaidika knows by heart the *Sanhitâ*, *Pada*, *Krama*, *Jatâ*, and *Ghana* of the hymns or *mantra* portion of the Veda, and the *Aitareya Brâhmana* and *Âranyaka*, the *Kalpa* and *Grihya Sûtra* of Âsvalâyana, the *Nighantu*, *Nirukta*, *Chhandas*, *Jyotish*, and *Sikshâ*, and Pâṇini's *Ashtâdhyayî on Grammar*. A Vaidika is thus a living Vedic library. The *Sanhitâ*, *Pada*, *Krama*, *Jatâ*, and *Ghana*, it may be repeated, are different names for peculiar arrangements of the text of the *mantras*, or hymns. The object of these different arrangements, with all their difficulties and intricacies, is simply the most accurate preservation of the sacred text; and the triumph of a Vaidika consists in repeating his Veda fluently, in all the ways just indicated, without a single mistake in the letters or accents.

The Vaidikas support themselves generally on the gifts or *dakshinâs* of those of their countrymen who are charitably disposed. Often recital-meetings, known by

the name of *mantra-jârgaras*, are held by rich Grihasthas in their houses, to which the principal Vaidikas in the town or village are invited. The Veda-reciters are also patronised by native princes; the more munificent of whom have occasionally established regular boards of examiners, by whom every candidate coming up from any part of India was to be examined and recommended for *dakshinâ* according to his deserts. 'But with all these sources of income, the Vaidika is hardly in easy circumstances. Hence the class,' according to Professor Bhandarkar, 'is gradually dying out, and the sons of the best Vaidikas in Punâ or the Konkan now attend Government English schools—a result not to be much deplored. Though the time and energy wasted in transmitting the Vedas in this manner, from the times of Kâtyâyana and other ancient editors of the Vedas, has been immense, we should not forget that this class of Vaidikas has rendered one important service to philology. I think the purity of our Vedic texts is to be wholly attributed to this system of getting them up by heart, and to the great importance attached by the reciters to perfect accuracy, even to a syllable or an accent.'

Thus the great practical result of the venerable system of mnemonic education in India is to be recognised in the precise and jealously preserved purity and integrity of its sacred books—a result of which Professor Max Müller is not inclined to underrate the importance. 'The texts of the Veda,' he says, when expatiating on the triumph of memory as instrumental to the preservation of an ancient literature, 'have been handed down to us with such accuracy that there is hardly a various reading, in the proper sense of the word, or even an uncertain accent, in the whole of the Rig-Veda. There are corruptions in the text, which can be discovered by critical investigation; but even these corruptions must have formed part of the recognised text since it was finally settled. Some of them belong to different Sâkhâs, or recensions, and are discussed in their bearing by ancient authorities. The authority of the Veda, in respect to all religious questions, is as great in India now as it has ever been. It never was uncontested any more than the authority of any other sacred book has been. But to the vast majority of orthodox believers the Veda forms still the highest and only infallible authority, quite as much as the Bible with us, or the Koran with the Mohammedans.

Some comprehensive, suggestive, and practical words of Sir W. W. Hunter may aptly conclude these remarks upon the schools of India and their peculiar erudition, the details of which are set forth very amply in chapters of the *Institutes of Vishnu*, and other ancient treatises which have recently been made accessible to the English reader. 'Through all changes of government,' writes Sir W. W. Hunter, 'vernacular instruction in its simplest form has always been given, at least to the children of respectable classes, in every large village. On the one hand, the *tols*, or seminaries for teaching Sanskrit philosophy at Benares and Nadiyá, recall the schools of Athens and Alexandria; on the other, the importance attached to instruction in accounts reminds us of the picture which Horace has left of a Roman education. Even at the present day knowledge of reading and writing is, owing to the teaching of Buddhist monks, as widely diffused throughout Burma as it is in some countries of Europe. English efforts to stimulate education have ever been most successful when based upon existing indigenous institutions.' Still a last word, in order to render to India the tribute of having successfully practised the method of mutual instruction from the remotest antiquity; for it was from India, in fact, that Andrew Bell, at the close of the eighteenth century, borrowed the idea of this particular instrument of education.

Japan.—China and Corea were the source from which the Japanese derived their first supplies of learning. So early as A.D. 300, there are accounts of Corean and Chinese scholars being brought over to impart a knowledge of the Chinese alphabet and Chinese books to the Japanese Imperial Court. Subsequently, native scholars who had been educated in China were able to take their places. Thus, there gradually grew up, in connection with the Imperial Government, a system of education which differed widely from its prototype, but was so far fitted to the wants of the Japanese empire as to secure not only its stability through many centuries, but a high degree of culture and civilisation.

The primary object of early Japanese education was not the universal or popular diffusion of knowledge; its more re-

stricted aim was, by means of special training, to prepare men to enter the service of the Government. For this purpose an institution, which we may call a university, was established at the capital of the empire. It had branches also in the various principal provinces, which were tributary to the central institution. The subjects of instruction were, in the higher departments, chiefly the Chinese classical writings, which were read and studied by the pupils, and commented upon by learned professors. Special branches of learning which were required in the public service were established as departments of this university. The care of the calendar and the regulation of the lunar year, with its varying months, were confided to a special department, which was responsible for the preparation of the national almanack. Astrology, used for the divination of the future, and medicine treated in its various branches in accordance with the Chinese system, were each constituted into departments. This university was supported by the Imperial Government, by means of grants of land and by assessments upon certain provinces. It passed through many periods of trial, and at last it perished; but, as the parent institution of the many which sprang up in different parts of the country, it had great influence upon the educational interests of Japan. The founder of the Tokngawa dynasty of Shôguns was a liberal patron of learning, and did much to encourage the organisation of schools and libraries. He established at his capital, in Yedo, a college, which attained great celebrity, and was attended by more than three thousand pupils. It was dedicated to the honour of the Chinese philosopher Confucius. Other institutions of a like character were founded by several of the more powerful daimiôs in their provinces. The daimiôs of Mito, Satsuma, Owari, Hizen, Chôsiu, Yechizen, and others vied with each other in maintaining, for the benefit of their subjects, institutions of the highest character. These institutions were, however, designed solely for the use of the *samurai* class; that is, those who held feudal relations as military retainers to their masters, and who are sometimes considered to rank as an inferior order of nobility. The children of the common people were not provided for in Government schools. The education they received was at private schools, or from private teachers. And it speaks well for the intelligence and love of learning on the part of the merchants, farmers, and artisans, that, even under these unfavourable conditions, the vast proportion of them could read and write the simpler forms of the language, and could cast up their accounts on the counting-frame. The women also were not educated at the great national schools, but were taught in private schools, or by tutors employed specially for their instruction. The education of females was less expensive and thorough than that designed for boys. They learned to read books in the easier styles, but were not generally taught the Chinese classical authors. They could write, and play upon some musical instrument, and were taught the female accomplishments of sewing, embroidery, and the like. There were, however, some notable exceptions to this limited female education. Female scholars of great celebrity appeared from time to time; and not a few of the most famous names in Japanese literature are those of females.

The learned were at this time devoted to the study of Chinese, and rarely composed in any other language, whilst the cultivation of the Japanese language was in a great measure abandoned to women. It is honourable to the women of Japan that they nobly discharged the task which devolved upon them, of maintaining the credit of their native literature. Probably no parallel is to be found in the history of European letters to the remarkable fact that a very large proportion of the best writings of the best age of Japanese literature was the work of women. The *Genji Monogatari*, the acknowledged standard of the language for the period to which it belongs, and the parent of the Japanese novel, was written by a woman; as were also the *Ise Monogatari*, the *Makura Zôshi*, and much of the poetry of the time. There is even reason to suppose that the traditions collected in the *Kojiki*, or *Book of Ancient Matters or Traditions*, the oldest extant composition of the Japanese, A.D. 711-712, containing their theogony and cosmogony, the events of the holy age or mythological period, and the history of the Mikados from the year 1, or 660 B.C., to the 628th year of the Christian era, and the 1288th of the Japanese, was taken down from the

mouth of a woman. With the exception of the last-named work, which is the bible of the Shintô religion, and which was committed to writing before the invention of *Kana*, the Chinese character was very sparingly used in books written by women, and the use of Chinese vocables was also extremely limited. Referring to the state of Japan in the latter half of the ninth century, when, owing to the impulse given by the works and example of Kosé no Kanaoka, one of the greatest painters to which the country has given birth, the tardy development of pictorial art had entered a new phase, Mr. Anderson pertinently remarks that it was not in art alone that marked progress had been made. From the seventh century Japan has possessed fully organised colleges, teaching music, astronomy, mathematics, medicine, philosophy, and other branches of learning which China and Corea had placed within reach of their insular neighbours.

The people, already separated from the military class—from the end of the eighth century—may be supposed, in the absence of historical record, to have been prosperous and contented; at any rate they do not appear to have found occasion to assert their existence in any manner disagreeable to their rulers. With the ascertainment of this separation of the military order from the masses devoted to commerce, agriculture, and various handicrafts, it is proper to follow the *samurai* boy, the typical representative of ancient and mediæval Japanese education, into some of the details of his school-life, into which he was initiated on the sixth day of the sixth month of the sixth year of his age. His first task was to make, after a copy, in weary routine, the Japanese letters. He used first a brush as large as one's little finger, so that every defect of his execution should be plainly manifest. The master sat by him and directed his movements. Every one of the complicated letters was required to be made with the strokes in the same order, and with the same emphasis. As the cost of paper would be a serious burden, pupils were required to use the same sheet many times over. The letters of one day were smeared out at its close, and the papers dried in the sun for the next. Even at the present day, in passing along the streets of a Japanese town, the schoolboy's copy-book is still to be seen hung out to dry; and the schoolboy himself can always be detected in his homeward march from school by his smouched fingers and face, which have received more than their share of the writer's ink. At the lowest estimate a schoolboy was required in six or eight years to learn one thousand different characters. Quicker pupils under competent teachers mastered as many as three or four thousand characters; whilst those who would pass for men of great learning were expected to be conversant with several tens of thousands. These characters had each their distinct meaning, so that the learner had not merely to acquire the mechanical art of making it, but also its meaning and its proper place and use in a sentence. Many years of the boy's life were mainly spent in this task of learning to write and to employ the numerous letters of the alphabet. The earlier reading-books were the simpler Chinese classics, in which the boy was taught the sounds of the characters as well as their meaning. As he advanced, more difficult books were used; and he was exercised not only in reading the passages, but also in explaining their meaning in the ordinary colloquial style. Books on manners and etiquette, and on morals, were also used for reading, and were made the text-books for instruction in these branches of education. Up to nine years of age the pupils read without much reference to meaning, and committed to memory some of the standard specimens of poetry. At about nine years of age the boys who were to receive a higher education entered the Chinese classical department. In this they were chiefly occupied with the study of the various treatises on Chinese philosophy; and from the formidable list of text-books which might be cited, it is evident that the life of the Japanese college student was not intended to be one of ease or indolence. In some schools the course of study was not limited to a definite time, but continued at the pleasure of the scholar. Hence men frequently continued their studies to mature years, like the fellows at an English University. The daily exercises began at about seven or eight o'clock, and continued until about four in the afternoon. There was no vacation, except for fifteen days at each of the equinoxes, when the festivals in honour

of Confucius were celebrated, and on the prescribed local and national holidays.

The daily routine of a Japanese classical school such as described above would be nearly as follows. At the opening the students all met, say to the number of three or four hundred, in a large assembly room. Here a professor gave a lecture to the whole body of students on some passage selected from one of the Chinese classics. The lecture consisted of explanations and comments on the selected passages, and of exhortation to the young men to conduct their lives accordingly. Each student was required to have a copy of the book in his hand, and to follow the citations and the comments of the professor. After this general lecture the students retired to separate classrooms, and there, under subordinate teachers, read over the works admitted to the list of text-books. They were required to explain the meaning to their teacher, and to answer his questions. On certain days, also, they drew lots to deliver discourses upon some passage which had been previously assigned. The professors and teachers were held in the greatest reverence, and it was deemed the greatest offence for the scholars to show their impatience or their lack of interest, by yawning, or lounging, or shifting their positions. Perhaps to this early severe training, carried on through many generations, are due that wonderful imperturbability of temper and that courtesy of manner which characterise the higher classes of Japanese society. Following these exercises were others for the teaching of composition, and for the affording of practice in the art of writing. Official correspondence was an object of special training, and was carried on through many years. In a country where rank and etiquette and the proper observance of official forms were deemed of the first importance, this branch of education was indispensable. The finer styles of literary composition were matters of ambition with those who desired the highest culture. They were taught to write poetry not only in the Japanese tongue, but also in pure Chinese. To this day it is a social amusement among men of culture to turn off impromptu verses, or to compose elegant maxims. It is a fair criticism on the ystem, that time was spent on the comparatively useless accomplishment of versification, which ought to have been employed in increasing their knowledge and in improving their prose composition. The latter part of the day was spent in physical exercises. As the schools we have been considering were for the benefit of the military class, the students were trained in martial exercises, such as shooting with the bow and arrow, throwing the lance, running, riding on horseback, and the sword exercise. By way of summary of the ancient system of Japanese education, Professor Rein observes that there was only one standard of learning, and he who had attained it and proved that he had done so in a formal examination was, together with the teacher who had so successfully trained him, held in great esteem. 'Just as there are still in Europe many who cannot conceive a thorough education without Greece and Rome, so, though for far more adequate reasons, the knowledge of the Chinese language and philosophy was in the eyes of the Japanese the Alpha and Omega of all thorough education. But this philosophy, even in the more liberal shape in which it was taught by Mencius, sprang throughout from a narrow feudalism, and formed a useful instrument for its preservation and furtherance. Japanese education formed respectful sons, docile pupils, obedient subjects, skilled calligraphers, enthusiastic admirers of antiquity, narrow-minded worshippers of the philosophy of Confucius; it did not arouse the intelligence, it left the individual conscience entirely under the control of custom, it kindled no religious thought or feelings, but encouraged the narrowest spirit of caste and clannishness. It was an education which taught the young *samurai* to be an obedient and loyal subject to his feudal lord, but contributed little to develop a general sense of justice or to humble the feelings; an education which allowed him, in utter disregard of universal human rights and duties, to try his sword on the first wayfarer he encountered outside the limits of his clan, or in overbearing quarrelsomeness to bar a rival's way. Accordingly, of all the innovations made during the Meiji period, the period of the present generation, those are justly regarded as the most important which have emanated from the Department of Education.'

Judea 1—1.—It has been the fate of the people of Israel to offer, even to the

present day, a startling demonstration of the power and tenacity of education. For more than eighteen hundred years of exile and dispersion, and without a ruler, the people of Israel, indeed, have never lost their national identity; but have preserved and perpetuated the habits, the manners, and the faith of so long a series of ancestral generations. The extraordinary vitality and the natural endowments of the race, 'its tenacity of temperament, and its wonderful activity of intelligence,' count for much as causes for the phenomenon which is every hour patent to the world, but 'it is just to attribute another part of it,' in the words of Professor Compayré, 'to the sound education, at once religious and national, which the ancient Hebrews have transmitted by tradition to their descendants.'

It is claimed for the Jews that they have, in all ages and under all circumstances, devoted themselves to the acquisition and the transmission of knowledge, both religious and secular, as if this duty were in the very front of their most sacred obligations. To fortify this claim resort has been had to imagination and romance; and Adam himself is placed at the head of a line of patriarchs, including Enoch and Noah, who directed schools which had been instituted for the enlightenment of the world before the flood. Melchizedek, King of Salem, is said in like manner to have kept a school in the city of Kirgath-sepher, the city of the book, or of writing. Abraham, himself the pupil of Heber, taught in Chaldea and in Egypt, and Josephus (B. i. of *Antiq.*, c. 8) affirms that he 'committed to the Egyptians arithmetic, and delivered to them the science of astronomy; for before Abraham came into Egypt they were unacquainted with those parts of learning; for that science came from the Chaldeans into Egypt, and from them to the Greeks also.' Jacob succeeded Abraham in the office of teaching, and the description which is given of Jacob in Genesis xxv. 27, as 'a plain man dwelling in tents,' has been paraphrased into the proposition that 'he was a perfect man, and a minister of the house of doctrine.' But such speculations are lightly dismissed when a tolerant criticism affirms of them that they 'must needs be very precarious.'

There is reasonable ground for the belief, if not, indeed, conclusive ground for the knowledge that Moses, Aaron, and the Elders of Israel instructed the people in the wilderness; and that many pious Israelites diligently instructed their children in the fear of God. But although nothing is more carefully inculcated in the law than the duty of parents to teach their children its precepts and examples, there is little trace among the Hebrews, in earlier times, of education in any other subjects. All this falls very short of proving the existence of the fabled schools of the patriarchs; and, indeed, the chief characteristic of the education of the Hebrews in the primitive period of their history, is that it was essentially domestic. During the whole of the biblical period there is no trace of the existence of public schools, at least for young children. Family life is the origin of the primitive society, where the idea of the state has scarcely dawned upon a theocratic people, of whom God was really and directly the King. The child was to become the faithful servant of Jehovah. To this end it was not required that he should be widely and variously learned; it was necessary that he should acquire, through oral teaching and the instructive example of his parents, the moral precepts and religious beliefs of the nation. With the Hebrews, the perfect man was the pious, virtuous character who approximated, in seeking to attain, to the ideal set forth by God himself, 'Ye shall be holy, for I the Lord your God am holy.' (Leviticus xix. 2.)

The wisdom, therefore, and instruction of which so much is said in the Book of Proverbs, is to be understood chiefly of moral and religious discipline, imparted, according to the directions of the law, by the parental doctrine and the example of the parents. Implicit exceptions to this statement may perhaps be found in the instances of Moses himself, who was brought up to be 'learned in all the wisdom of the Egyptians;' of the writer of the Book of Job, who was evidently well versed in natural history and in the astronomy of the time; of Daniel and his companions in captivity, who were chosen for office in the court of Nebuchadnezzar as being 'skilful in all wisdom, and cunning in knowledge, and understanding science,' and above all, in the intellectual gifts and acquirements of King Solomon, which

were even more renowned than his political greatness, and the memory of which has been so widely preserved, not without exaggeration, in oriental tradition. The statement already made, however, as to the limitation of ordinary Hebrew education, may, in all probability, be regarded as representing its chief aims, not only when the law was most strictly observed, but also when, after recurring periods of decline from the Mosaic standard, attempts were made by monarchs, as Jehoshaphat or Josiah, or by prophets, as Elijah or Isaiah, to inspire, or at least to inculcate, reform in the moral condition of the people on the basis of that standard.

It is assumed, from the frequency with which corporal chastisement is inculcated in the Bible, and especially in the Book of Proverbs, that the domestic discipline of the ancient Hebrews was harsh and severe—a severity of which, if it ever existed to the extent imputed, subsequent ages witnessed a remarkable relaxation.

It is probable that boys only were taught to read and write; but it would seem that much attention was paid to what was assumed to have been the most desirable accomplishments for girls. Even in later times the Rabbis did not prescribe an advanced Hebrew education for females; yet they recommended, besides a thorough domestic training, a sound religious instruction and the acquirement of some foreign language—Greek by preference. Girls were never required to be brought up as great scholars or professors; but were rather to be trained as skilful and accomplished housewives. They were taught to spin, to weave, to prepare food for the table. to superintend the work of the household, and also to sing and to dance. It was further expected of the woman that she should devote herself to the moral and religious training of her children, by which alone could she approve herself a true mother in Israel. It is clear also that the prophetical schools included within their scope the instruction of females, who were occasionally invested with authority, both of a judicial and a prophetical character.

On the whole it is safe to conclude that intellectual culture was rather incidental than capital or essential to the primitive education of the Hebrews, in whose eyes the great thing was moral and religious instruction, and the evolution of an ardent, intense, and unprecedented patriotism. Fathers taught their children the history of the nation; and the periodical celebration of the series of divinely-wrought events that had marked the progress of the people of God, in the form of recurring fasts and festivals, in which the children participated, served to fill their hearts with gratitude to a Heaven which had stooped to their hills and held its hosts at their service, and with a patriotic love for their country. It is this love which, in its tenderness and its fierceness, has furnished to universal history the most consummate illustration of national unity—of the absorption of the aggregate mass of the people into a single personality of undivided egotism.

In the course of time the prophecies, and expositions of them, were added to the earliest scriptures of the Law, as instruments of education to the children of the Jews, who were also taught to say by heart the genealogies, which were at once so dear to their pride and so necessary to justice in ascertaining and renewing, according to what may be fairly and characteristically described as their Jubilee system, the rights of personal freedom, and of family inheritance. Whatever the subjects of study might be, however, it was necessary that the Jewish boy should combine with them the acquirement of some trade, handicraft, or profession; and the Jewish parent who neglected or evaded this obligation was said to be virtually teaching his son to steal.

The sect of the Essenes, one of the three great sects into which the more cultivated of the Israelites were divided after the captivity, though themselves abjuring marriage—at least so far as the strictest order of them was concerned—devoted themselves largely to the education of children, which, however, they limited chiefly to ethical training and to instruction in the Divine Law.

With regard to the prophetical schools, or schools of the prophets just referred to, Calmet observes: 'Under Joshua we see a kind of academy of the prophets, where the sons of the prophets, *i.e.* their disciples, lived retired, in study, meditation, and reading the law of God. There were *schools* of the prophets at Naioth in Rama. David and Samuel withdrew thither (I. Sam. xix. 19, 20, &c.). Saul sent

messengers thither to apprehend David, &c.

'We find others also under the prophets Elijah and Elisha at Bethel (II. Kings ii. 3) and in the plain of Jericho; and a great number in the kingdom of Israel (II. Kings, ii. 5). Some have thought that Elijah had also a society of them on Mount Carmel (I. Kings, xviii. 4, 13; xix. 1; xx. 35, &c.). These prophets were consulted on affairs of importance: people went to hear their lessons, as appears from the hostess of Elisha. Her husband asks her why she went to see the prophet, seeing that day was neither the Sabbath nor the new moon. (Lightfoot, *Centur*, p. 661; II. Kings, iv. 23.) These *schools* continued down to the captivity of Babylon; and it should seem, that the captives resorted to such establishments to hear the prophets, when there were any, in the places where they resided. Ezekiel relates sundry conversations with the elders of Israel, who came to see him and to consult him. The people also assembled about him, as if to hear him and to be instructed by him; but they were not very careful to reduce his instructions to practice (Ezek. viii., xiv., xx.).' Previous to the captivity it was in these schools, colleges, or societies of the prophets that the chief seats and depositories of learning were to be found; and from the same institutions commonly proceeded that succession of public teachers who, at various times, endeavoured to call back to the purity of their religious allegiance both the people and the rulers of a less or more alienated Israel. After the return from Babylon, an epoch from which the Jews began to incorporate the acquirement of foreign languages in their curriculum of education, the schools of the prophets were succeeded by synagogues of instruction and enlightenment. Learning, which in its primitive limitation had always been highly esteemed, acquired with its growing variety and usefulness an ever increasing amount of respect; and educated persons, according to Rabbinical tradition, were called 'sons of the noble,' and were allowed to take precedence at tables. In most cities there was at least one of these synagogues, which were either themselves used as schools, or had places attached to them for the purpose. It is even suggested on the strength of a passage in the book of Esther, that there were synagogues at Shushan, or Susa, in the time of Esther and Mordecai. At any rate, they rapidly became numerous throughout Judea; and in Jerusalem, where every trading company had its own, and the strangers and sojourners several, their frequency was variously estimated in numbers that ranged from 394 to 460.

It is recorded on the authority of St. Jerome that, a little before the birth of Jesus Christ, two famous Rabbins, Shammai and Hillel, the heads of two celebrated *schools*, formed two parties among the Jews; and were the masters of the Scribes and Pharisees. Akiba succeeded them, and was master to the famous Aquila, the translator of the Scriptures of the Old Testament. Akiba had Meir for his successor, after whom appeared Johanan, son of Zachai, then Eliezer, afterwards Delphon, Joseph the Galilean, and lastly Joshua, who presided over this school at the taking of Jerusalem. Thus the Jews made out the succession of their doctors in the time of Jerome (A.D. 342–420).

After the destruction of Jerusalem, colleges inheriting and probably enlarging the traditions of their predecessors, were maintained for a long time in several localities. One of the most celebrated of these was established at Jabneh, or Japhne, in Galilee; the fame of whose learned doctors is often mentioned in the Talmud. The Great Sanhedrim was also held at Japhne; and it was in this holy city, according to Jewish tradition, that the great Gamaliel was buried. Lydda, or Diospolis, was for some time previous to the destruction of Jerusalem the seat of another very famous Jewish school, scarcely second to that of Japhne. About the time of the siege it was presided over by Rabbi Gamaliel, second of the name. But the most famous academy was that of Tiberias in Galilee, which bore a conspicuous part in the wars between the Jews and Romans. The Great Sanhedrim subsequently to the fall of Jerusalem, and after a temporary sojourn successively at Japhne and Sephoris, fixed its seat at Tiberias about the middle of the second century. It was here that the Mishna, or code of the Jewish laws, was compiled by the great Rabbi Jehuda, surnamed Hakkodesh, about A.D. 200; and the Massorah or body of traditions which

transmitted the readings of the Hebrew text of the Old Testament, and preserved by means of the vowel system the pronunciation of Hebrew, originated in a great measure at Tiberias. These schools, in process of time, were dispersed into other countries; so that from about the middle of the third century the Jews are constrained to seek the succession of their doctors beyond the Euphrates, where they say schools subsisted in various places, now of doubtful identification, for eight centuries—that is till about A.D. 1030, when they were destroyed by the Saracens.

The method of teaching in the synagogues and in the schools is plainly observable in the Gospels and in the Acts of the Apostles.

But it is to the Talmud that we turn for the most minute and precise particulars about the later and more liberal education of the Jewish youth; who, according to the principles laid down in the Mishna, began at five years of age the study of the Scriptures, and at ten the Mishna, becoming subject to the whole Law at thirteen, whilst, finally, at fifteen they proceeded to the study of the Gemara, the decisive commentaries which bear to the Mishna the relation of complement, or completion. The sages of the Talmud held the school and the process of instruction in the very highest estimation. To them the school was the very essence of life, the calling of a teacher the highest and holiest of all pursuits. The school was necessary to the life of the world which 'exists only by the breath of school-children'; and 'a town which has no school and no school-children should be demolished.' Taken at their true worth, teachers and schools, therefore, are, rather than the magistrates and the civil and military defenders, to be regarded as the supporters and guardians of the city. The life of the teacher was so intimately associated with that of the pupil, that the two were, in fact, under all conditions, inseparable.

But independently of any other arrangement, it was always incumbent upon the father to be the instructor of his son. 'He who teaches the Sacred Law to his children is as meritorious as if he had himself received it on Mount Horeb.' It was obligatory that in every town and village schools should be established; and that children of five or six should be compelled to attend them. The plentifulness of schools is illustrated by a numerical hyperbole of the Talmud, which states that 'in the town of Betar there were four hundred schools for children.' In each of these schools there were four hundred teachers, each of whom had four hundred scholars under his charge. In the early Talmudic period the instruction under roofs was supplemented by lessons in the open air, so as to prevent overcrowding and the consequent offence against sanitation. This *al fresco* instruction seems to have continued to be the custom until the time of Rabbi Jehuda Hanassi, who was the first to determine that instruction should be imparted under cover. In the schools, the children were seated either on the ground, on stools, on cushions, or on benches or forms. 'The master,' says Maimonides, 'sat at the uppermost place surrounded by his pupils, like a crown on the head, in order that every pupil might see and hear him. The master did not sit on a stool and the pupils on the ground, but all sat either on stools or on the ground. Formerly it was the custom for the master to sit, and the pupils to stand, but, shortly before the destruction of Jerusalem, it was arranged for both pupils and teachers to sit.' On moral grounds no unmarried man or woman was allowed to undertake the post of teacher. But even from those otherwise qualified, who sought to undertake that function, a certain selection was made. A system of thorough grounding was favoured as opposed to breadth and superficiality; and sympathy and patience were required in the teacher, so that the exceptional dullness of pupils might be cheerfully met with the requisite amount of reiteration. The teacher should, further, be truthful and conscientious, pious and religious; and not only competently versed and fluent in the sacred books, but able and ready to supply a correct interpretation.

The veneration due to the teacher was considered by the ancient Rabbis as co-ordinate with the fear of God. 'The fear of thy instructor should be as the fear of heaven'; and upon the words, 'Thou shalt fear the Lord,' the Talmud remarks, 'This includes the learned teachers also.' The teacher was to be preferred in honour and acts of kindness and respect to the natural father, who was the originator of the physical life merely. This sentiment

is common to the Talmud and the institutes of Vishnu, as well as one other direction to the effect that the master 'should not teach an unworthy pupil.' 'Let the honour of the pupil,' says the Talmud, addressing the teacher, 'be as dear to thee as thine own.'

From the time of the captivity, and, *a fortiori*, after their dispersion the Jews had become increasingly tolerant, not only of various sciences, as, for instance, of astronomy, geometry, and botany, but also of the languages of the Gentiles. 'Their great admiration for the Greek tongue did not, however, in the least diminish their interest,' says Mr. Spiers, 'in other branches of education, and they studied the various languages, the arts and sciences of their times. The more Judaism had gathered strength in the course of successive ages, the more had it penetrated into the heart and mind of the people, and the more did they evince a desire for the knowledge of foreign tongues. As in Palestine during the Second Temple the Israelites were acquainted with the Syriac idiom, which was then the dialect of the neighbouring people, and as in Alexandria they wrote and spoke Greek, so also we see them in Rome, about the time of the destruction of the Temple, rise up as Latin poets and critics. Without aversion and without prejudice they went to work, relying upon the wise teachers of the Talmud. 'Every word that came from the mouth of God divided itself into seventy languages, that is to say, into all existing languages. They thereby showed that every dialect springs from the Divine Spirit and continues consecrated as long as it preserves and expresses that which is just and true.'

Persia.—The schools of the ancient Persians, who were a military rather than a theocratic nation, were schools in which the moral and intellectual virtues and faculties were built up chiefly through a course of bodily training, in which character was nobly formed by physical exercise, endurance, frugality, abstinence, self-denial, and self-control. Having regard to the instruments and the aims of their culture, it is scarcely surprising to find the Persians making considerable advances in the direction of a general education, and their State, of all the governments in the world, appearing amongst the first as a distinct agency in its promotion. Their religion—a typical and exemplary expression of that dualism the central idea of which may be strictly defined as the deification of two co-ordinate but antagonistic principles of good and evil, and the spirit of which asserts itself in every system that refuses to recognise a dynamic God only, of whom may be predicted ethically an absolute exclusion and neutrality, or an absolute comprehension and indifference—their religion incited them to make it the duty of each man to contribute to the final victory of Ormuzd over Ahriman, of good over evil, by devoting himself to a life of virtue, to a continued and consistent endeavour after physical and moral perfection. To certain Greek writers the education of the Persians, and the quality of the career and character which it formed or fostered, seemed to approach, if not to realise, the heroic; and Xenophon in particular, in his scorn for the institutions and the corrupt administration of his native State, essayed, in his *Cyropædia*, the composition of a tableau, the foremost figure of which assumed to be historical, and the others to be living in conditions that had a basis in existing institutions. Upon this work the author impressed so deeply the stamp of feasibility as to leave it debateable whether it was intended for a romance or a history. Of course, the purely romantic side of the argument has had its supporters, and Cicero, for one, says the *Cyropædia* was written, not to suit historical fidelity, but to exhibit a representation (*effigies*) of an excellent government. In many important respects it fails of the truth of history; chronology, for instance, is disregarded, and the sequence of events anticipated by a development not short of the miraculous. The political affinities of Xenophon, an Athenian of high rank, were with the more aristocratic economy of Sparta, and he has set the idealised institutions of this State to work themselves out in unison with those of Persia, and in the latter country as an arena. Whilst serving under the younger Cyrus he had enjoyed an opportunity of gaining an insight into the actual and the possible of the Persian *régime*, and had assumed, by making the elder Cyrus his hero, to add to that monarch's military glory the more subdued and mellowed hues of justice and moderation. In the first book of the *Cyropædia* are laid down the institutions in and by which Cyrus was formed and educated

preparatory to his high career; which career, it is to be remembered, is also worked out in the spirit of these institutions. The Persian laws seem to begin with a provident care for the common good, and by anticipation forestall the possible bad effects of imperfect training in any particular family by extending over all education a State control. Within a free agora—not for traffic—are arranged in their several courts the four classes of a representative city: the boys, the youths, the full-grown men, and the elders. To each of these classes belong its appropriate duties of routine and contingency, and each higher or older class has proportional privileges and immunities. The idea of the education generally is military; the boys are overlooked by presidents taken from the elders; the youths are superintended by the full-grown men; and the presidents are themselves regulated by a superior presidency. No individual amongst the Persians is excluded by law from honours and magistracies, but all are at liberty to send their boys to the public schools. Here they pass through a course of practical justice, and learn to acquire self-control, temperance, obedience, and above all to detest the *crime* of ingratitude. This vice, as evidencing a profane carelessness with regard to the demands of religion and filial piety, and the calls of patriotism and friendship, is an offence obnoxious and punishable by law. The second class, of young men, pass their time by day and night in a round of duties, of which the armed guardianship of the State is typical. Having discharged all the duties of this class they pass into that of the full-grown men, upon whom devolves the burden of foreign military service, and who are eligible to honours and magistracies. After passing through this class unexceptionably, they are enrolled amongst the elders, an order which stands composed of approved and excellent men. These, freed from the claims of military service, dispense public and private justice; with them rest the election of all magistrates, and the power of life and death. There is a nicely-graduated reverence of class to class, youth to age, subjects to rulers, and all to law. The Laconising attitude of Xenophon is discoverable in the military-like organisation of his States, and the gradual working up to honours by means of seniority. Conservatism was pretty well assured, and innovation discouraged, by an age-standard of admission to the Spartan Gerousia, and of eligibility to the ruling class or council of the Persians.

Such is a description in brief of the educational code of the Persians according to the *Cyropædia*, for which Xenophon alone is responsible. But with his version of the system he extols, it is pertinent to compare the account of the same which is arrived at by the incorporation with the picture by Xenophon of touches incidentally supplied by Herodotus, Plato, Strabo, and others. This incorporation is presented in convenient epitome by Canon Rawlinson, who, in his account of Persian education, is careful to note that 'a small part only rests upon the unsupported authority of the Athenian romancer.' Canon Rawlinson says: 'All the best authorities are agreed that great pains were taken by the Persians—or, at any rate, by those of the leading clans—in the education of their sons. During the first five years of his life the boy remained wholly with the women, and was scarcely, if at all, seen by his father. After that time his training commenced. He was expected to rise before dawn, and to appear at a certain spot, where he was exercised with other boys of his age in running, slinging stones, shooting with the bow, and throwing the javelin. At seven he was taught to ride, and soon afterwards he was allowed to begin to hunt. The riding included, not only the ordinary management of the horse, but the power of jumping on and off his back when he was at speed, and of shooting with the bow and throwing the javelin with unerring aim while the horse was still at full gallop. The hunting was conducted by State officers, who aimed at forming by its means in the youths committed to their charge all the qualities needed in war. The boys were made to bear extremes of heat and cold, to perform long marches, to cross rivers without wetting their weapons, to sleep in the open air at night, to be content with a single meal in two days, and to support themselves occasionally on the wild products of the country, acorns, wild pears, and the fruit of the terebinth tree. On days when there was no hunting they passed their mornings in athletic exercises, and contests with the bow or the javelin, after which they dined simply on the plain food of the men in the early times, and then employed

themselves during the afternoon in occupations regarded as not illiberal—for instance, in the pursuits of agriculture, planting, digging for roots, and the like, or in the construction of arms and hunting implements, such as nets and springes. Hardy and temperate habits being secured by this training, the point of morals on which their preceptors mainly insisted was the rigid observance of truth. Of intellectual education they had but little. It seems to have been no part of the regular training of a Persian youth that he should learn to read. He was given religious notions, and a certain amount of moral knowledge by means of legendary poems, in which the deeds of gods and heroes were set before him by his teachers, who recited or sung them in his presence, and afterwards required him to repeat what he had heard, or, at any rate, to give some account of it. This education continued for fifteen years, commencing when the boy was five, and terminating when he reached the age of twenty.

'The effect of this training was to render the Persian an excellent soldier, and a most accomplished horseman. Accustomed from early boyhood to pass the greater part of every day in the saddle, he never felt so much at home as when mounted upon a prancing steed. On horseback he pursued the stag, the boar, the antelope, even occasionally the bear or the lion, and shot his arrows, or slung his stones, or hurled his javelin at them with deadly aim, never pausing for a moment in his career. Only when the brute turned on his pursuers, and stood at bay, or charged them in its furious despair, they would sometimes descend from their coursers, and receive the attack or deal the *coup de grâce* on foot, using for the purpose a short but strong hunting-spear. The chase was the principal delight of the upper class of Persians, so long as the ancient manners were kept up, and continued an occupation in which the bolder spirits loved to indulge long after decline had set in, and the advance of luxury had changed to a great extent the character of the nation.

'At fifteen years of age the Persian was considered to have attained to manhood, and was enrolled in the ranks of the army, continuing liable to military service from that time till he reached the age of fifty. Those of the highest rank became the body-guard of the king, and these formed the garrison of the capital. They were a force of not less than fourteen or fifteen thousand men. Others, though liable to military service, did not adopt arms as their profession, but attached themselves to the court, and looked to civil employment as satraps, secretaries, attendants, ushers, judges, inspectors, messengers. A portion, no doubt, remained in the country districts, and there followed those agricultural pursuits which the Zoroastrian religion regarded as in the highest degree honourable.' Persian education has found a modern admirer in the person of Canon Farrar, who has shaped his opinion in words of eulogy to the following effect:—'We boast of our educational ideal. Is it nearly as high in some essentials as that even of some ancient and heathen nations long centuries before Christ came? The ancient Persians were worshippers of fire and of the sun; most of their children would have been probably unable to pass the most elementary examination in physiology, but assuredly the Persian ideal might be worthy of our study. At the age of fourteen—the age when we turn our children adrift from school, and do nothing more for them—the Persians gave their young nobles the four best masters whom they could find to teach their boys, wisdom, justice, temperance, and courage—wisdom including worship, justice including the duty of unswerving truthfulness through life, temperance including mastery over sensual temptations, courage including a free mind opposed to all things coupled with guilt.'

Rome: see ROMAN EDUCATION.

For Assyria, Babylonia, and Chaldæa, consult Canon Rawlinson's *Five Great Monarchies of the Ancient Eastern World*, 2nd edit. 1871; Mr. George Smith's *Assyria, from the Earliest Times to the Fall of Nineveh*, 1875, in series of *Ancient History from the Monuments*, and *History of Babylonia*, edited by A. H. Sayce, 1877; Professor A. H. Sayce's *Babylonian Literature*, 1877, and the same author's Hibbert Lectures on the *Origin and Growth of Religion as illustrated by the Religion of the Ancient Babylonians*, 1887; Lectures (unpublished) delivered at the British Museum by Mr. Boscawen and Mr. Bertin in 1887 and 1888. For China: M. Edouard Biot's *Essai sur l'Histoire de l'Instruction publique en Chine*, 1865; Professor Terrien de Lacouperie's *Early*

History of Chinese Civilisation, 1880; Dr. W. A. P. Martin's *The Chinese: their Education, Philosophy, and Letters*, 1881; Professor Robert K. Douglas's *China*, 1882; Dr. S. Wells Williams's *The Middle Kingdom*, revised edition, 1883; *The Sacred Books of China*, 1885, in the series of *The Sacred Books of the East*, in progress, and others. For Egypt: Canon Rawlinson's *Five Great Monarchies*, 1871, and his *History of Ancient Egypt*, 1881; Professor Georg Ebers's *Uarda: Roman aus dem alten Aegypten*, 1877; Brugsch-Bey's *Geschichte Aegyptens unter den Pharaonen*, 1877–8; M. P. Le Page Renouf's Hibbert Lectures, 1879, on the *Origin and Growth of Religion as illustrated by the Religion of Ancient Egypt*, 1880; Mr. E. A. W. Budge's *Dwellers on the Nile*, in *By-paths of Bible Knowledge*, vol. viii. 1885; and others. For India: Professor Max Müller's Preface to the *Rig-Veda-Sanhita, The Sacred Hymns of the Brahmans translated and explained*, vol. i. 1869; Professor R. G. Bhandarkar's *The Veda in India*, in the *Indian Antiquary* for May, 1874; *The Sacred Laws of the Aryas*, 1879, *Institutes of Vishnu*, 1880, and the *Laws of Manu*, 1886, in the *Sacred Books of the East*, in progress; Sir W. W. Hunter's *India*, in the *Encyclopædia Britannica*, 9th edit., vol. xii. 1881; Professor Max Müller's Hibbert Lectures for 1878, on the *Origin and Growth of Religion as illustrated by the Religions of India*, new edit. 1882. For Judea Josephus' *Antiquities of the Jews* and *Wars of the Jews*; Calmet's *Dictionary of the Bible*; Rev. H. W. Phillott's article 'Education' in Dr. William Smith's *Dictionary of the Bible*; Rev B. Spiers' *School System of the Talmud*, 5642–1882; Professor Compayre's *Histoire de la Pédagogie*, 1883; Cappelli's Paroz's *Storia Universale della Pedagogia*, 1884; Rev. Dr. Edersheim's *Sketches of Jewish Social Life in the days of Christ*, 1876; and the *Life and Times of Jesus, the Messiah*, 4th edition, 1887. *See* for *Japan*:—Sir Rutherford Alcock's *Capital of the Tycoon*, 1863; Professor Léon de Rosny's *Anthologie Japonaise*, 1874, and *La Civilisation Japonaise*, 1883; *Transactions of the Asiatic Society of Japan*, 1872–1882, *passim*; Mr. Basil Hall Chamberlain's *Classical Poetry of the Japanese*, 1880; Isabella L. Bird's *Unbeaten Tracts in Japan*, 1880; Professor J. J. Rein's *Japan nach Reisen und Studien*, 1881; Mr. W. E. Griffis' *The Mikado's Empire*, 1883; Mr. William Anderson's *Descriptive and Historical Catalogue of a Collection of Japanese and Chinese Paintings in the British Museum*, 1886; and, especially, *An Outline History of Japanese Education, Literature, and Arts; prepared by the Mombusho (Department of Education)*, Tokio, Japan, 1877. For Persia: Herodotus; Xenophon's *Cyropædia*; Canon Rawlinson's *Five Great Monarchies of the Ancient Eastern World*, 2nd edit. 1871; Professor Compayré's *Histoire de la Pédagogie*, 1883; and others.

Schools of Music.—No more direct evidence of the rapid growth during later years of music in the cities and towns of the United Kingdom could be furnished than the great increase of schools and academies wholly devoted to the cultivation of the art. But a little more than a couple of decades back the Royal Academy of Music in Tenterden Street, Hanover Square, was almost the only institution of the kind to which metropolitan students could resort for practice and instruction in the several branches of the science. The Academy no longer stands alone, but, thanks to a perception by the directorate and committee of management of modern desires and requirements, it fully maintains its influence and importance. Instituted in 1822 and incorporated by royal charter in 1830, the Academy has been identified with the life labours of many eminent composers, vocalists, and instrumentalists of the past as well as of the present time. The privileges appertaining to King's scholars and to Mendelssohn scholars have been enjoyed by Miss Agnes Zimmermann, Miss Maude Valerie White, Messrs. Henry Weist Hill (now the principal of the Guildhall School of Music), John Francis Barnett, William G. Cusins, Alexander Campbell Mackenzie (now principal of the Academy), Arthur Seymour Sullivan, and Eaton Faning, to enumerate only a few well-known names figuring in the list. The Potter exhibition, founded in 1860 as a testimonial to Cipriani Potter, who was principal of the Academy from 1832 to 1859; the Westmorland scholarship, established in 1861 in memory of John Fane, the eleventh Earl of Westmorland, founder of the Academy, who died in 1859; the Sterndale Bennett scholarship; the Sir John Goss scholarship, for candidates under

eighteen years of age, who have been members of church choirs and intend to make organ-playing their chief subject of study; the Thalberg scholarship, for pianists of both sexes; the Henry Stuart scholarship; the Sainton-Dolby scholarship; the Balfe scholarship; the Sir Michael Costa scholarships, bequeathed by the late famous conductor; and the Liszt scholarship, founded in honour of the visit to this country in 1886, a few months before his death, of the distinguished composer and pianist, with many others, are worth the winning and are a great incentive to the development of youthful talent. The competition for the prizes and exhibitions is generally active, and invariably evokes the utmost interest. The Royal College of Music, in the establishment of which the Prince of Wales was particularly prominent, is located at South Kensington, and may be said to have been raised upon the foundation of another school, under the most influential patronage, which terminated its existence a few months previous. The College is of recent formation, but the service it has rendered to the cause of music is noticeable. It can boast of a large number of exhibitions, and is likely to gain in prosperity the more its benefits offered to students become known. The Guildhall School of Music has been remarkably successful under the direction of Mr. Weist Hill. Its promotion is due to the Corporation of the City of London, but not long did it require the assistance of such a powerful advocate. The students were soon so numerous as to put the resources of the original premises in Bucklersbury to the severest test. Enlargement seemed of no avail, so it was determined to erect a building specially adapted to the school on vacant ground on the Thames Embankment, near Blackfriars Bridge. The corporation has behaved with characteristic liberality to the school in the matter of prizes, the catalogue of which has been considerably augmented by private donors. In its new quarters the Guildhall School is certain to prove an important factor to musical progress among those sections of the community hitherto debarred from the particular advantages of study and tuition. There are several other schools of music in the metropolis, but as the majority are based upon the principles of the three great establishments already mentioned, it is scarcely necessary to describe them in detail. (*See* MUSIC, SINGING, SOL-FAING, and TONIC SOL-FA.)

Schools of the Middle Ages. *See* MIDDLE AGES (SCHOOLS OF THE).

Schools of the Prophets. *See* SCHOOLS OF ANTIQUITY, section JUDEA.

Science and Art Department of the Committee of Council on Education.—In the year 1835 a Select Committee of the House of Commons was appointed on the motion of Mr. William Ewart, M.P. for Liverpool, 'to inquire into the best means of extending a knowledge of the Arts and of the Principles of Design among the people, especially the manufacturing population of the country.' The inquiry was continued in the session of 1836, and the Committee recommended the establishment of schools of design. In accordance with this recommendation a proposal was made to the Treasury by the Lords of the Committee of Privy Council for Trade that a sum of 1,500*l.* should be taken in the Estimates for the establishment of a normal school of design, with a museum and lectures. The Treasury having consented, the President of the Board of Trade (Mr. Poulett Thomson) presided at a meeting held on December 19, 1836, at the Board of Trade, of certain Royal Academicians and others interested in art, which provisional body, early in 1837, was constituted the 'Council of the Government School of Design,' the members being unpaid, and the vice-president of the Board of Trade being an *ex-officio* member of the Council. Rooms in Somerset House were granted, and the School opened on June 1, 1837. In 1841 the Government decided to afford assistance towards the formation and maintenance of schools of design in the manufacturing districts, giving an annual grant for the training and payment of teachers, for the purchase of casts, and the preparation of models for the use of those schools. In 1842 the Board of Trade reconstituted the Council, and placed the School of Design under the management of a director, controlled by the Council, which body was itself to be controlled by the Board of Trade. The Parliamentary vote for 'schools of design' which was administered by that Department had increased in 1851–2 to 15,055*l.*; the branch schools in such centres of industry as Manchester, Birmingham, Glasgow, Leeds, and Paisley were then seventeen in number,

the expenditure on them absorbing nearly one half of the vote. An inquiry into these schools by a Select Committee of the House of Commons in 1849 showed that they were not working satisfactorily. New principles of management were therefore adopted in 1852 by the President of the Board of Trade, Mr. Labouchere, and subsequently Mr. Henley. The Council was abolished, and a 'Department of Practical Art' was constituted, with a general superintendent (Mr. Cole) and an art adviser (Mr. Redgrave). The scope of this Department was enlarged in 1853. In the Speech from the Throne at the opening of Parliament that year her Majesty stated that 'The advancement of the fine arts and of practical science will be readily recognised by you as worthy the attention of a great and enlightened nation. I have directed that a comprehensive scheme shall be laid before you, having in view the promotion of these objects, towards which I invite your aid and co-operation.' A science division was added, and the 'Department of Science and Art' was created. The Department remained under the control of the Board of Trade until 1856, when the Education Department was constituted, to include '(*a*) The Education Establishment of the Privy Council Office; (*b*) the establishment for the encouragement of science and art, now under the direction of the Board of Trade and called the Department of Science and Art,' and these two departments were placed under the Lord President of the Council, who was to be assisted by a vice-president of the Committee of Council on Education. The Parliamentary vote for 1856–7 was 64,675*l.*, while that for 1882–3 was 351,400*l.*

The Science Division of the Department.—When the Department was enlarged in 1853, so as to embrace science as well as art, the Board of Trade submitted to the Treasury a detailed scheme for carrying into effect the announcement in the Queen's Speech above quoted. The scheme provided for an extension of a system of encouragement to local institutions for practical science similar to that already commenced for schools of practical art, by the creation in 'the metropolis of a science school of the highest class capable of affording the best instruction and the most perfect training,' and by aiding in the establishment of local institutions for science instruction. It also united in one Department, under the Board of Trade, the Government School of Mines and of Science applied to the Arts, the Museum of Practical Geology, the Geological Survey, the Museum of Irish Industry, and the Royal Dublin Society; all these institutions being in the receipt of Parliamentary grants. Until the end of 1854 there was a separate secretary for science (Dr. Lyon Playfair), who discharged also the functions of inspector of local schools. Though the principle of granting aid to Science Schools and classes was established in 1853, no general system, applicable to the whole country, for making grants was formulated until 1859. Experiments were made and schools were established by special minutes applicable to each case after negotiation with the locality. The general arrangements were that the teacher or teachers received an allowance in the nature of a certificate allowance; and their incomes from fees, subscriptions, &c., were guaranteed by the Department for a certain number of years at amounts which varied in different cases. In this way classes were opened at various places, but after a time many of them fell through. In 1859 the first general science minute was passed. This enabled any place to establish Science classes and to obtain State aid according to certain fixed rules. The teachers were required to have passed the examination of the Department, and obtained a certificate of competency to teach. The aid consisted of certificate allowances, earned by passing a certain number of pupils; additional payments for pupils who obtained prizes; grants towards the purchase of apparatus, books, &c.; and prizes and medals to the students. The first examination for teachers was held in November 1859, and a number of new schools and classes were rapidly formed. The payments on results in 1872 amounted to 25,201*l.*, and in 1882 to 49,908*l.*, or at the rate respectively of 13*s.* 8*d.* and 13*s.* 3*d.* per student under instruction. Payments were made to committees on account of the instruction given by 1,857 teachers. In 1867 the special examination for teachers' certificates was abolished, and it was decided that any person who passed in the advanced stage, or in honours, at the ordinary general examination in May should be qualified to earn payments on results Sir Joseph Whitworth, in 1868, founded thirty scholarships of the total

value of 3,000*l.* a year, and vested them in the Lord President or other minister of public instruction for the time being, for the purpose of promoting the mechanical industry of this country by aiding young men in acquiring proficiency in engineering. Scholarships and local exhibitions in aid of local efforts had been founded by the Department in the previous year with a view to assist students who showed an aptitude for scientific instruction. Building grants were first extended to Science Schools in 1868. In 1870 the Department commenced the system of special grants towards laboratory instruction, with extra payments on account of the practical work of students. These are now given in Chemistry and Metallurgy. Under the present system of aid, payments are made on the results of instruction as tested by the May examinations of the Department. The papers of questions for this examination are prepared by a staff of examiners, and the answers are examined by them with the aid of assistants, who are paid by piece-work on a scale approved by the Treasury. The examinations in each subject are held simultaneously, and supervised as far as possible by the local committees. As the number of classes and examinations multiplied rapidly it was found that this was too great a strain on local voluntary effort in the large centres, and a system of paid special local secretaries and assistants, nominated by the local committees, was commenced in 1870. This has been found to work well, the payment being provided half by the locality and half by the Department. In 1878 it was considered desirable for various reasons to separate the examination of the students in Training Colleges from the ordinary May examinations. Special rules and payments were made for these, and the first December examination was held in 1878. (For the arrangements made for the training of Science teachers *see* NORMAL SCHOOL OF SCIENCE and ROYAL SCHOOL OF MINES.) The rules under which grants are made to Science Schools, each of which must be under a properly constituted and approved local committee, are contained in the *Science Directory* (Eyre & Spottiswoode, price 6*d.*). The following are the Sciences towards instruction in which aid is given :—Practical, plane, and solid geometry; machine construction and drawing; building construction; naval architecture and drawing, pure mathematics; theoretical mechanics; applied mechanics; sound, light, and heat; magnetism and electricity; inorganic chemistry (theoretical); inorganic chemistry (practical); organic chemistry (theoretical); organic chemistry (practical); geology; mineralogy; animal physiology; elementary botany; biology, including animal and vegetable morphology and physiology; principles of mining; metallurgy (theoretical); metallurgy (practical); navigation; nautical astronomy; steam; physiography; principles of agriculture. Each subject is subdivided into three stages or courses—the elementary, the advanced, and honours—except mathematics, which is subdivided into seven stages, with 'honours' in three groups of stages.

The assistance granted by the Science and Art Department is in the form of (1) public examinations, in which Queen's prizes and medals are awarded, held at all places complying with certain conditions; (2) payments on the results of examination and on attendance; (3) scholarships and exhibitions; (4) building grants and grants towards the purchase of apparatus, &c.; (5) supplementary grants in certain subjects; and (6) aid to teachers and students in attending the Normal School of Science and Royal School of Mines, South Kensington. Payments are made on the results of the May examination on account of the instruction of students of the industrial classes or of their children. The payments are 2*l.* for a first class and 1*l.* for a second class in the elementary and advanced stage, and 2*l.* and 4*l.* for a second or first class respectively in honours. Extra payments are made for attendance in organised Science Schools. Special payments are also made for practical chemistry and for practical metallurgy. The teacher must have given at least twenty-eight lessons to the class, and each student must have received twenty lessons at least.

Art Division.—On the reorganisation of Schools of Design in 1852 as the Department of Practical Art, the minute states that the three principal objects of the Department were (*a*) the promotion of elementary instruction in drawing and modelling; (*b*) special instruction in the knowledge and practice of ornamental art; (*c*) the practical application of such knowledge to the improvement of manufactures. The country was, according to

the minute, to be encouraged to establish a new class of schools of art, which were to be maintained by local effort with conditional aid from the Department, which was granted wherever a local committee was found willing to establish day and evening classes, to appoint a certificated master, and to assign to him part of the fees of the school, and to engage him to teach drawing in at least three elementary schools. The aid from the Department consisted in payments of 10*l.* on each certificate held by the master, and in grants towards the cost of examples, and in medals and prizes awarded on a selection of the works sent to London for examination. In 1853 the Central Training School was moved from Somerset House to Marlborough House, where temporary schoolrooms were erected. In 1854 teachers and pupil-teachers of elementary schools were encouraged to pass examinations in drawing by the offer of payments on the results of their instruction when given to pupil-teachers in elementary schools. The pupil-teacher system was extended to schools of art, a payment of 15*l.* a year being allowed for each pupil-teacher. In 1855 the Department gave prizes to children in elementary schools taught drawing by masters of schools of art. In 1856 these schools were collectively examined at schools of art by the inspectors of the Department, and in 1857 a payment of 3*s.* for every child who obtained a prize was authorised to be made to the art master who had taught him. In 1857, also, teachers of elementary schools were authorised to receive an additional augmentation, not exceeding 5*l.*, to their salaries, provided they had passed examinations in drawing, and taught the subject satisfactorily in their schools. In 1857 the Department and Central Art Training Schools removed from Marlborough House to South Kensington. In this year also the inspection of art schools was completely organised, so that once in the year each school was visited by an inspector, who awarded local medals, and selected the best of the students' works to be sent up to London to the national competition to compete for one hundred national medallions and prizes. In 1856 the training colleges for teachers under the Education Department, Whitehall, were examined by the Department in drawing for the first time. The examinations were at first conducted by her Majesty's inspectors, but afterwards by officers of the Department. In the same year the system of 'building grants' for schools of art was commenced. In 1862 the system of payments on certificates to the teachers of elementary schools was abolished, and the whole of the payments to the school made dependent on results tested by examination. Minutes were passed in 1863 extending this principle to the existing masterships of the schools of design and other schools of art. The masters of schools of design who had held direct appointments from the Board of Trade were superannuated. At the same time local scholarships and national scholarships tenable for one year were established, the latter, fifteen in number, to enable advanced students intending to be designers' or manufacturers' draughtsmen to prosecute their studies in the Central School and Museum. In 1865 provision was made for night classes for instruction in drawing, as distinguished from schools of art. In 1876 it was decided to remove the limitation by which aid to 'Night Classes' was restricted to classes held after six p.m., and to extend the same aid to art classes held in any school or other institution complying with the rules of the Department. Aid is now given towards the promotion of art instruction under the following heads: (*a*) to elementary day schools where drawing is taught concurrently with reading and writing; (*b*) to training colleges for the teachers of elementary schools; (*c*) to art classes for young persons above twelve years of age, and older students of the industrial classes; (*d*) to schools of art which are devoted entirely to art instruction, and where the student can obtain a complete course of instruction in art in the various stages laid down in the *Art Directory* (Eyre & Spottiswoode); (*e*) to the National Art Training School (*q. v.*, which is maintained for training art teachers, designers, and art workmen, who are aided by scholarships gained in schools of art.

Science and Art Museums.—The great educational object of museums, by which is to be understood *general* museums, and not those restricted to scientific specialities, as of geology, surgery, or the industrial arts, is to bind together the world of all antecedent periods in the intelligence and sympathy of man. They

supply, or are calculated to supply, the *catena* of humanity, placing men *en rapport* with their fellows of all ages, countries, and conditions. They do more, they place him in contact with the entire terrestrial creation; not only as that is differenced as human, animal, or vegetable, but as it comprises every object which is at the least endowed with the humble faculty of occupying space. *Men* are revealed in them chiefly in cunning representations and imitations; and more frequently still in their productions and the instruments and phenomena they have fashioned around their life. Animals, vegetables, and minerals are themselves represented in fact, in preparation, or by the art of the taxidermist. In the words of Mr. Ruskin, 'the right function of every museum to simple persons is the manifestation to them of which is lovely in the life of Nature, and heroic in the life of Man.' He would have these conditions most rigidly defined and most religiously —not to say rather fancifully or fastidiously—respected. For 'the museum,' he says again, 'is to manifest to these simple persons the beauty and life of all things and creatures in their perfectness Not their modes of corruption, disease, or death . . . not even their modes of nourishment, if destructive; you must not stuff a blackbird pulling up a worm, nor exhibit in a glass case a crocodile crunching a baby. . . If you wish your children to be surgeons, send them to Surgeons' College; if jugglers or necromancers, to Messrs. Maskelyne and Cooke; and if butchers, to the shambles; but if you want them to live the calm life of country gentlemen and gentlewomen, manservants and maidservants, let them seek none of Death's secrets till they die.'

Mr. Ruskin's precise repetition of the phrase 'simple persons,' as distinguished especially from professional students, gives us the opportunity of declaring that the desire of advancing science is very different from that of advancing the knowledge of the non-scientific people. And it is conceded to experience and enlightened opinion that both these objects cannot be attended to at the same time, and with the same means and instruments, without hindrance and injury to one or the other.

In the *New Atlantis* of Lord Bacon, which the learned author takes advantage of the lustihood of maritime adventure in his day to fix in 'the midst of the greatest wilderness of waters in the world,' in the far, fair solitudes of the deep-bosomed Pacific, we have fancifully shadowed forth an institution for the interpreting of nature, and the producing of great and marvellous works for the benefit of man. This institution bears the quaint name of Solomon's House, or the College of the Six Days' Works, a university which in its ramifications embraces State and people. Here society was based upon Plato's unhopeful aspiration; for the rulers *were* philosophers. The end of their foundation was, in words imputed to the president or father of the house, 'the knowledge of causes and secret notions of things, and the enlarging of the bounds of human empire to the effecting of all things possible.' The fellows of the college were employed severally as travelling fellows, called merchants of light, as depredators, mystery men, pioneers or miners, compilers, downy men or benefactors, lamps, inoculators, and interpreters of nature.

These fellows of Solomon's House are the experts, the specialists, the officials of our museums, who diffuse the light which they have gained with love and labour. They are distinguished, as a rule, by profound scholarship and unwearying powers of research. It is they who acquire the secrets of each in order to group as a whole. It is they who discover for themselves and for others the thread in what would otherwise be a clueless labyrinth. It is their care that the mighty maze should not be without a plan. They show the *then* and the *now* of the ages, with their sequence and succession, the *here* and the *there* of place, and the relation of each to the other. Their daily prerogative is the elucidation of unity in multiplicity. They are at war with chaos, whose vanquished and discordant elements they reconstruct to rhythm and a microcosm.

But these masters and controllers of the educational powers of our museums may be excluded with this bare but most honourable mention. They are venerable because they are indispensable. For it is not enough for the educational use of museums that they should be mere repositories of curiosities, they must be *ordered* repositories, on which have been brought to bear the principles of relativity and classification. The most ordinary of visitors,

the 'simple persons' of Mr. Ruskin, upon whom the influence of museums is the real and crucial test of their educational value, are not to be precipitated into a wilderness of specimens and left there, like babes in a wood, as the helpless victims at once of objective confusion and subjective bewilderment. Their wonder is to be approximately satisfied, so that its quality may be purified and its range extended; their taste is to be elevated; their discrimination of likenesses, identities, and differences is to be directed and developed. The small homestead and *peculium* of their knowledge is to be fenced and defended in the face of the arid and measureless stretches of an ignorance which, in the nature of things, must be for ever invincible and inviolate.

'The first function of a museum,' says Mr. Ruskin, in words which regard art and natural history as alike cared for in an ideal institution, 'is to give example of perfect order and perfect elegance, in the true sense of that test-word, to the disorderly and rude populace.' 'The word elegance contemplates chiefly architecture and fittings. These should not only be perfect in stateliness, durability, and comfort, but beautiful to the utmost point consistent with due subordination to the objects displayed. To enter a room in the Louvre is an education in itself.' But Mr. Ruskin has a meed of praise for our own British Museum, which, he says, 'is on the whole the best ordered and pleasantest institution in England, and the grandest concentration of the means of human knowledge in the world.' 'In the British Museum,' to quote an American tribute to the same institution, 'are inscriptions and monuments of art arranged in groups, and representing Egypt and Mesopotamia, Attica, Assyria, Ionia, Rhodes, Cyprus, and Cyrene, so that the visitor walks from hall to hall as from city to city, and from century to century, and sees all forms and features of past civilisation face to face.'

The great desire of the people to learn is proved by the numbers which crowd the galleries of this and our other museums. If not all the good possible be produced by these visits, the result falls short of the effect to be desired, partly from the circumstance that the minds of the visitors have not received that training which is required to make them impressible, receptive, or retentive of the truths which they survey. This is the great objection to the wholesale or habitual introduction of lectures or demonstrations in our galleries—a kind of exercise which it would seem expedient to limit to audiences already selected and prepared for them by special study, aptitude, or affinity.

On the other hand, there seems little objection to the plan proposed by some advocates of museum extension, by which museums should be occasionally converted into schoolrooms, where teachers could bring their zoological, geological, and other natural science classes, and find well-arranged material for illustrating their lessons.

Mr. Ruskin advocates the covering of a certain proportion of the current cost of museums by 'small entrance fees, not,' he says, 'for any miserly helping out of the floor-keepers' salaries, but for the sake of the visitors themselves, that the rooms may not be encumbered by the idle, or disgraced by the disreputable.'

This, however, is a matter of detail, which, with others of a miscellaneous kind, it is well at least to mention at the conclusion of this article, in order to bring them formally within the consideration to which they are amenable. They include the educational use of those temporary or fugitive museums which we call expositions or exhibitions, the mobilising of museums, the temporary alienation of specimens, for the advantage of others, from the collections to which they belong; and the expediency or morality of opening museums on Sundays.

These are vexed questions, for the settlement of which, and of others of an administrative character, a writer in *Nature* a few years ago proposed the institution of a conference of curators and others interested in the efficiency of our museums.

'In order,' he said, 'that all the important matters connected with the work of museums may receive full and careful consideration, we would suggest that an association be formed to consist of curators and others engaged in the management of museums. . . By holding periodical meetings, and constantly changing the place of meeting from town to town, the various museums of the kingdom could be inspected, and their contents and plan of arrangement discussed and civilised. Friendly communications would thus be opened

among all museums, and changes could be arranged for their general advantage.'

Science Teaching.—As the object of education is to prepare the student for the adequate discharge of the duties which fall to his lot in maturity as a member of a civilised community, those subjects are best fitted to form the educational curriculum which either serve as direct cultivators of the intellectual faculties or yield knowledge utilisable in later life. The exclusive attention erstwhile devoted in 'a polite education' to the study of the dead languages (*see* CLASSICAL CULTURE) was defended on the ground of their supreme excellence as moulders and trainers of the mental abilities. Mathematics and logic, the only sciences admitted in the older system, were extolled for their educative influence on the ratiocinative faculty, for their sharpening of the power of detecting flaws in a chain of reasoning. Regarded as an instrument of education, science is now defended by the advanced school of educational reformers, notably by Mr. Herbert Spencer, as offering advantages greater than any other subject can possibly confer. It cultivates the eye and the hand, giving manual dexterity, delicacy of touch, swiftness and neatness in manipulation—qualities invaluable to the workman and workwoman. It trains the perceptive faculties, cultivates the habit of keen and accurate observation, teaching the observer to distinguish similarity amid differences, difference amid similarities, to grasp the significant facts while disregarding their irrelevant concomitants. It exercises the reason and the judgment in its inductive and deductive processes, while it at once encourages and disciplines the imagination by calling upon it to suggest hypotheses which shall be based on analogy and subjected to rigorous verification. Nor does it leave untouched the moral qualities, for it demands for its successful prosecution unwearying patience, absolute candour, strict accuracy, courageous acceptance of facts. The scientific student learns the great truth that 'nature is conquered by obedience.' It is not necessary to do more than allude to the utility of scientific knowledge in later life, whether in its applications to the supply of human necessities or as a source of æsthetic and rational pleasures.

Science-teaching, then, should be of a kind which should secure to the student this educative and disciplinary effect, its aim being the training of the pupil's intellect even more than the storing of his memory with facts. To this end it must be, above all else, practical, and the teacher must have gained his knowledge at first hand from nature, as well as at second hand from books. The statements of facts made by the teacher must be substantiated by experiment, and the experiments made in class by the teacher should be repeated by the students severally in the laboratory practice, which should invariably succeed the teaching in the lecture-hall. Elaborate apparatus should not be supplied, but the pupil should be taught, as far as possible, to construct his apparatus for himself. The extraordinary and embarrassing results which follow from carelessly constructed apparatus, improperly adjusted tubes, soiled glasses, &c., carry to the student instruction other than that conveyed directly by his experiments. The value of accuracy, cleanliness, patience, and order becomes vividly real to him when he sees the smooth successes in the lecture-hall followed by his own failures in the laboratory. Unless science-teaching be thus made practical it had better not be attempted. The extraordinary blunders made by students at science examinations would be impossible had the students ever seen the things they describe, and a mass of ill-apprehended facts shovelled into the memory from text-books is worse than useless from the educational point of view.

Next in importance to the practical nature of the teaching comes the wise selection of the things taught. Science-teaching in schools is not intended to make specialists, and it is necessary to avoid the danger, so impressed by Professor Huxley on science-teachers, of failing to make the students 'see the wood because of the trees.' In elementary teaching the main principles of a science should be laid down and illustrated by experiment—e.g. in chemistry, the differences between elements, compounds, and mixtures; the indestructibility of matter; the changing of one form of matter into another, as of solids into liquids and gases, liquids into solids and gases, gases into liquids and solids; the laws of chemical combination as illustrated by the preparation of typical compounds; and so on. The relations of the sciences to each other should be

pointed out, and they should be taken up in the order of their growing complexity. An elementary acquaintance with mathematics, physics, and chemistry should precede the study of the biological sciences.

The method of teaching must vary with the age and acquirements of the students. With advanced and soundly-trained pupils there is probably no better method than that of the lecture, supplemented by the private study of well-selected text-books, and, of course, by practical work. The student may be left to take his own notes as the lecture proceeds, and some hours later he should rewrite the lecture from his notes, and thus make himself a text-book on the subject of study. But this method is inapplicable to classes of young students, or to classes of adults who have not had previous scientific training. For such the following method has been found most successful. Each student is provided with a rough note-book and a second book for full notes; the teacher explains and illustrates his subject for a short time, wherever possible interpolating questions, so as to keep the attention of his pupils on the alert and ensuring their understanding of his discourse; during this time no notes are to be taken, but the undivided attention of the student is to be given to the teacher. When the teacher reaches a convenient break in his subject he stops, and gives out headnotes which cover the ground over which he has travelled; these, and only these, are written down in their rough note-books by the students. During the interval which elapses between two lessons in class the students write out under each headnote, in their second books, as much as they can remember of the subject dealt with under that note, and at the next lesson these notes are read out in order by one student after another, each student following in his own notes the several readers, and correcting his notes as he goes along by the better notes of his fellows and the comments of the teacher. With children it is necessary for the teacher to read and correct the notes. In this fashion the student obtains facility of expression as well as acquaintance with facts, and if he is preparing for an examination this practice is of the greatest utility.

It is of importance to provide the student with a skeleton system into which he can insert his facts, and so have them in order for mental reference. Thus, in teaching Biology, all the facts relating to an organism may be classified under the following heads: 1, structure; 2, digestion; 3, absorption; 4, circulation; 5, respiration; 6, secretion; 7, nervous system; 8, sense organs; 9, motor organs; 10, reproduction; 11, development; 12, classification. This methodical system of studying an organism assists the memory, and enables the student, on demand, to write out a coherent and intelligible account of it. A similar skeleton may be formed for other sciences. (*See* also articles NORMAL SCHOOL OF SCIENCE, SCIENCE AND ART DEPARTMENT, and TECHNICAL EDUCATION.)

Scotland, Education in. *See* LAW (EDUCATIONAL), UNIVERSITIES (section Scotland), and EDUCATIONAL INSTITUTE OF SCOTLAND.

Secondary Schools. *See* CLASSIFICATION, GRAMMAR SCHOOLS, and PUBLIC SCHOOLS.

Self-Command, Self-Control.—These terms refer to the higher exercise of the will in restraining and controlling the natural impulses and propensities. Thus, when a child makes an effort to abstain from a forbidden action, or to master a feeling of anger, it is exercising self-control. This self-regulation shows itself in three directions answering to the three domains of the mental life, viz. the control of the thoughts, of the feelings, and of the actions. The perfect control of the whole mind by a good and rational will is the highest result of mental development, and should be the end of education (*see* MORAL EDUCATION). Such complete self-mastery involves a firmly-fixed habit, the establishment of which is a long and difficult process, especially in the case of impulsive and passionate children. The educator must early begin to exercise the child's will in an effort at self-command. Thus intellectual instruction requires an effort of attention, a restraint of the impulses to bodily movement and wandering thoughts. Again, the moral educator has from the first to encourage the child to restrain its feelings, and more especially to govern its temper. The moral educator is further concerned with the development of that species of self-control which consists in denying ourselves the satisfaction of our own desires, an exercise in which, according to Locke, the principle of all virtue and excellency lies (cf. article

TEMPER). (*See* Locke, *Thoughts*, § 107; Bain, *Mental and Moral Science*, 'The Will,' chaps. iii. and ix.; Sully, *Teacher's Handbook*, p. 462 and following.)

Self-Education is that part of the work of mental development which the individual carries out for himself. It is a necessary supplement to the early school education, in which the learner is surrounded by external incentives and aids. While, however, it is customary to divide the process of education into these two stages, it must not be forgotten that the underlying motives of self-education—the desire to gain knowledge and to improve character—must be appealed to as soon as the child's intelligence and will are sufficiently developed to enable it to appreciate and co-operate with the teacher's aims. The teacher's efforts too often fail to be followed up in later years by the independent exertions of the pupil, just because the desires and aspirations which prompt to and sustain self-education have not been developed. Thus the methods of intellectual instruction adopted have not succeeded in kindling a love of knowledge which would burn on when the years of school are over. In moral training, too, it should be the educator's aim, as Kant affirms, to exercise the will in a pursuit of virtue for its own sake, and in a conscious effort at self-development and self-improvement. While the work of self-education is necessary in every case, it fills an exceptionally large place in the case of the few, endowed with a preternatural degree of intellectual capability or force of will, who have been to a large extent self-taught and self-made (cf. article ORIGINALITY). In a certain sense *all* education is self-education. The acquirement of knowledge is made, the power to use knowledge—to think, to feel, and to will—is developed by, and in proportion to, the activity of oneself. The term, however, is generally applied, in a somewhat different sense, to the efforts of a person who, having passed the usual school age, finds himself without the means of external help and guidance, and seeks by his own unaided or but slightly aided exertions to continue or to commence his education. It is in this sense that we shall consider the expression. Now, what is the service which a skilful teacher renders to a learner? He selects the subjects to be studied, and the parts of each subject; and he decides how part shall follow part, and subject subject. He chooses the method or manner of study—so that the right faculties shall be exercised—and by his wide knowledge and constant suggestiveness he exhibits and maintains a living connectedness not only between the parts of each subject, but also between the subjects themselves. He guides and stimulates the learner to make use of, and to test by use, the knowledge acquired; and is ever on the watch to regulate and direct exertion, to supply explanations where needed, and to recall the learner's attention to any knowledge which seems likely to slip away. This service of the skilled teacher is of vital importance to the young beginner; but, except in suggesting connectedness and in general guidance and stimulation, it tends to grow of less and less importance as the learner himself grows in knowledge and in development of power to use knowledge. To one who has been properly educated during the school period it would seem sufficient to give advice, following as nearly as may be the practice of the teacher. Do not choose too many subjects; select in preference *first* subjects of which you already know something and which have a bearing of some kind on the work of your everyday life, and *then* those which grow out of these; having ascertained from some competent authority the best text-books, seek to master the main points first, and fill in the lesser matters later; constantly test your knowledge by employing it in every available way—not only knowledge newly acquired, but also old knowledge with it—and, when the chance offers itself, at times test its amount and readiness also by entering some good public competition. By every means in your power maintain a connectedness in *all* that you learn, do not let old knowledge slip away, and always endeavour to gain knowledge by personal experience rather than at second-hand; always try to see how the new knowledge just gained affects what you already know. Ally yourself with other students when you can, although their subjects may not be yours. What they learn and care about will often prove unexpectedly suggestive with regard to your own knowledge; and community in study is always stimulative and refreshing. Lastly, remember that the best education

is one which enables you to live out your life effectively in many directions, and does not consist in the mere accumulation of facts; it is the *result* of well-mingled knowledge which you know how to employ, and is not the knowledge itself.

A person who has had no school education is now so rare a being that it seems hardly necessary to offer him advice. This, however, may be said: Choose some subject of observation such as you have the best means of studying practically; and work from it as a centre gradually outwards in different directions, never losing the connection with your central subject; observe, classify, experiment, reason, and then again observe. Your best central subject will be one of the following: botany, natural history, physiography, or perhaps geology. Do not, at any rate for some considerable time, attempt to make any but your central subject a special study; and follow up your other subjects which branch from it simply for the sake of that central subject. For the rest note the advice already given to the more instructed student. (*See* Professor Blackie's work, *Self-Education*, and art. 'Selbsterziehung' in Schmidt's *Encyclopädie*.)

Seminaries.—This is one of the terms used in Germany for training colleges for teachers.

Senses, Education of the.—In its widest and ordinary meaning this phrase includes both the exercise and strengthening of the organs of sense, and the training of the mind in the perfect use of these. It is important, however, to distinguish the education of the senses as the mechanism by which external impressions are received, from that of the *observing faculty* as the power of combining and interpreting such impressions. In the present article only the former will be dealt with. The senses claiming attention are the higher intellectual senses, sight and hearing, together with touch and the muscular sense. The object of training these senses as above defined is to render them quick and exact in transmitting or reporting the impressions received from without. This presupposes, first of all, an exercise of the organs themselves, as the eyes and the hand, and a perfect command of the muscular actions necessary to the reception of clear impressions, e.g. the adjustive movements of the two eyes necessary to distinct and rapid seeing. This training of the physical organs connects itself with physical education as a whole; for the organs of sense, and particularly the eye, are the most delicate of the bodily structures, and easily affected by excessive stimulation as well as by disturbances of bodily health. With this exercise of the organs must be conjoined the calling forth of the activity of the child's mind in attending to the impressions received from without, so as to note accurately their precise character. The child only exercises his sense of sight when he discriminates degrees of light and shade, varieties of colour, length of line, and so forth. Such discrimination is a gradually acquired attainment. The infant, though endowed with normal powers of vision, cannot distinguish the finer *nuances* of colour. Hence the training of the sense rightly begins with placing objects in juxtaposition, so that impressions may be compared and discriminated. In conjunction with this, the child must be exercised in recognising impressions when they recur. Thus, in training the colour sense, the instructor should lead the child to identify the several colours by name. In addition to this training of the senses on the intellectual side, there is a cultivation of them on the side of æsthetic sensibility. Thus the child can be exercised in appreciating and delighting in the beauties of colours and musical tones, and their relations. Such exercises form the first step in æsthetic culture. Cf. articles DISCRIMINATION, EYE, EAR, TOUCH, and PERCEPTION. (*See* H. Spencer, *Education*, chap. ii.; Bain, *Education as a Science*, p. 16 and following, and 170 and following; Sully, *Teacher's Handbook*, chap. vii.; Schmidt's *Encyclopädie*, article 'Sinnenübung'; Buisson's *Dictionnaire de Pédagogie*, article 'Sens.')

Sensibility, Sensitiveness.—By the term sensibility is meant first of all the susceptibility of the organism (or rather certain portions of it known as 'sentient') to the action of stimuli. Sensibility is an endowment of all animal organisms, but differs greatly in its forms. In its simplest phase it involves merely the capacity of being affected by the pleasurableness or painfulness of impressions. This is the emotional side of sensibility. In its higher manifestations it includes the capacity of distinguishing impressions according to their intensity and their quality, e.g. the particular strength or loudness and pitch

of a sound. This is the intellectual side of sensibility, and must be carefully distinguished from the emotional side. Intellectual sensibility, or discriminativeness, varies greatly among individuals, ranging from extreme incapacity, as illustrated in colour-blindness, up to the most delicate discriminativeness as seen in the artist's finely graduated colour-vocabulary. It is on the degree of discriminativeness possessed by a sense that its intellectual value immediately depends; and a child's whole range of knowledge is limited by the discriminativeness of its senses. On its emotional side sensibility means primarily the capability of being affected agreeably or disagreeably by sense-stimuli, as pressure, sound, &c. In a secondary manner it refers to the mind's emotional susceptibility, or the capability of feeling sorrow and joy, fear, anger, &c. In this sense it forms the basis of the life of feeling or emotion. It is important to bear in mind that there is no uniform connection between the degrees of intellectual and of emotional sensibility. Thus a child may be very discriminative of sounds, but not necessarily susceptible to the disturbing effects of sounds in the same degree. The more acute degrees of sensibility on its emotional side are often marked off by the term Sensitiveness. A sensitive eye is one that is quickly affected by the pleasurable and painful aspects of light and colour. A sensitive child responds quickly to emotional excitements, is moved to fear displeasure &c. by slight causes which others would not feel. (*See* Sully, *Teacher's Handbook*, p. 122, &c.; Galton, *Inquiries into Human Faculty*, p. 27, &c.)

Sessions. *See* TERMS.

Sex in Relation to School-Life.—An important physical distinction between boys and girls is commonly lost sight of. It is that while the growth of boys continues fairly steadily up to manhood, girls concentrate a large share of their growth in a few years, especially between the age of twelve and a half and fifteen years. For this and other reasons the age of puberty is a more critical time for girls than boys, and schooling requires to be carefully regulated at this period. Another fact bearing on the same question is that girls, as a rule, have fewer games and less muscular exercise of any kind than boys, and for this reason are much more apt to suffer in consequence of school-work. It is only fair to say that the ill effects ascribed to school-work are oftener due to the excitement of novels or other forms of dissipation, to late hours and impure atmosphere, or to defective exercise. Undue devotion to music seems to have a specially exciting influence on some girls, acting on their emotional faculties. Similarly, emulation in connection with examinations is more likely to be injurious to girls than boys. With due care for the physical system, however, there can be no doubt that girls are quite as competent for the higher branches of study as boys, and may pass on to university life without any detriment to their general health.

Shakspere in Schools. — Shakspere may be used in schools for reading aloud, in which case the plays may very well be abridged, so as to bring each of them within the scope of two, or at most three, lessons. The plays are chiefly used, however, as the subject-matter of *literature* lessons—at least of lessons which go by that name, though in fact they are anything but literary. There are certain things necessary for making the study of these plays *as literature* thoroughly effective. They should not be the first literature which school children study. They are not simple enough in subject, feeling, or expression. Quite young children may read them for their interesting stories, but they cannot study them as literature. Let children begin with something as simple as *John Gilpin*, and be led up gradually through two or three stages to the plays. Then, and not till then, will they get a full and valuable training and delight from the plays. Children should not have their study of the plays overwhelmed with dates, and grammar, and archæology, and antiquarianism, and philology. Just so much of these should be used as *really enlighten* the *learners* as to the text and its full meaning—just so much and no more. The plays should be treated as *plays*, and as masterpieces of literature; as works of art, that is, not as mere stalking-horses for pedants. The introductions should throw light upon the *art* of the plays, their human value, and beauty—not merely upon dates of composition and original sources. They should put the learner in the right position and give him the right point of view for thoroughly understanding and appreciating what is before him. In studying the

plays the learners should be led to see and feel the value and force of speeches as indications and revelations of character; and they should be enabled to appreciate the language for its skilful expression of thought and its beauty of sound; and hence they must also understand the thought itself, and the mode in which it expresses itself, as well as the meanings of the words used. These are some of the chief points to be attended to. For the rest see the article on ENGLISH LITERATURE.

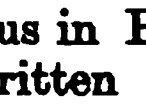
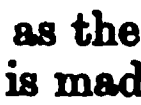
Shirreff (Miss). *See* EDUCATION OF GIRLS.

Shorthand.—The first system of shorthand is attributed to Cicero, but from the decline of the Roman empire there is an interval of about a thousand years during which nothing is heard of that or of any other system. The credit of reviving stenography belongs to an Englishman, Timothy Bright, who in 1588 published *Characterie, the Art of Short, Swift, and Secret Writing by Character*. Only one copy (that in the Bodleian Library) is known to exist. An examination of it shows that, compared with any recent system, *Characterie* was very cumbrous, difficult, and uncertain. Of the eighteen signs which formed its alphabet seventeen were compound, and hundreds of words were represented by signs purely arbitrary. Since Bright's day nearly two hundred English systems have appeared, but to describe or even name a twentieth of them would be foreign to the purpose of this article. It will be enough to mention those only which have found any considerable number of students. *The Art of Stenography . . . invented by John Willis, Bachelor in Divinity*, was published in 1602, and reached a tenth edition. In 1654 was issued *Semigraphy, or Art's Rarity*, by Jeremiah Rich, but the real author was William Cartwright, who was Rich's uncle. After Rich's death appeared an exposition of his system by another hand. For many years this was the chief system. Pepys wrote his diary in it, and Locke commended it in his Treatise on Education. Rich's method, however, was not so good as Mason's, published in 1672, and still written in a modified form, under the name of Gurney's (Thomas Gurney having adopted and improved the system early in the eighteenth century), by the official shorthand writer to the Houses of Parliament. About 1720 John Byrom completed a system which was an improvement on anything that had yet been seen. Till the death of an elder brother made him a man of property he lived by teaching his method, which consequently was not made public till after his own death. In 1786 Taylor's system appeared. It was as brief as Byrom's, simpler, and more successful. Three years later appeared Dr. Mavor's, which, though not quite so successful as Taylor's, passed through many editions. In 1815 James Henry Lewis published his successful *Ready Writer, or ne plus ultra of Shorthand, being the most easy, exact, lineal, speedy, and legible method yet discovered*. The author, speaking of it in his very useful *Historical Account of Shorthand*, says: 'The unparalleled success which has attended the dissemination of the above system precludes the necessity of descanting on its peculiar advantages; it is amply sufficient to observe that it has completely superseded all others,' &c., &c. The last system which need be noticed is Pitman's Phonography, which has found more writers than all other English systems combined. The first edition appeared in 1837.

The characteristics of a good system are: (1) The alphabet is simple. The simplest elements are the straight line and the curve, and unless most letters consist of these the system must necessarily be long, and therefore useless for the purposes of the reporter. A straight line may be perpendicular, horizontal, oblique with a right slant, or oblique with a left slant. A curve may be written in the same four directions, and in each direction may face two ways. We have thus twelve characters consisting of a simple straight or curved stroke, but these are manifestly insufficient for an alphabet, and various devices have been adopted to increase them, such as writing them of two thicknesses or of two lengths.

(2) Allied sounds are represented by allied signs. In writing quickly the proper slope, or length, or thickness may not always be observed, but the possibility of a serious mistake in reading is greatly reduced if the principle indicated be observed. Thus *pail*, *bail*, *fail*, and *vail*, each beginning with a labial, differ only in the initial, but if the characters of these initials be somewhat similar the most likely error is the transposition of two of them, and the context will suggest the

right word, if, for instance, *pail* be written for *bail*.

(3) The vowels are detached from the consonants. In following a speaker it is absolutely impossible to write every letter of every word he utters, and in all systems most of the vowels are omitted. If, as in the older systems, the vowels are an integral part of the word, its appearance will be completely changed by their omission, and in its brief form it will be hard to recognise. If, on the other hand, the vowels are detached, the 'outline' of the word is the same whether they be written or omitted. Thus in Phonography *communication* is written in full  and without the prefix and vowel signs  , and an experienced writer recognises the second as rapidly as the first.

(4) Provision is made against the confusion which would be caused if all the words having the same consonants were written with the same outline. *Pair*, *peer*, *appear*, *poor*, *pyre*, *pure*, *pray*, *prow*, *parry*, and *perry*, for instance, are by no means all the words in which *p* and *r* are the only consonants.

(5) There are few or no awkward joins between the letters. In some systems the joins are so awkward that words can only be written correctly by being written very slowly.

(6) No word goes so far above or below its own line as to interfere with the words in the next. The confusion which would ensue were this rule disregarded is evident.

Apart from its immense practical value shorthand has a high educative worth which should commend it to all good teachers. The first point which a principal, thinking of introducing shorthand into his school, has to decide is the system to be adopted, and no hesitation need be felt in recommending Pitman's Phonography, because it is easy to write, easy to read, and easy to learn. Even those who deny that it is the best system admit that it is a good one. It is, moreover, the most popular system. This popularity is of advantage in several ways. The sympathy of numbers is in itself helpful. The learner is certain to find phonographers everywhere; his chances of being able to use the system for correspondence are infinitely greater than if he wrote any other, and there are hundreds of enthusiasts who will correct his exercises free of charge. For the learner, practice in reading is as important as practice in writing. The instruction books must be supplemented by a study of the best models for writing, and no system can furnish a twentieth part as many of these as Phonography.

It has been suggested that Phonography being, as the name implies, a phonetic system, the practice of it tends to injure the writer's spelling; but this objection is groundless. Correct orthography is a matter of the eye, and so long as words have to be represcnted in one way it is dangerous to make the eye familiar with any other way. Thus if we habitually saw *rong* we might write the word so when *wrong* was required; but although in phonography the *w* is omitted, what the student sees is not *rong* but and this cannot affect his spelling.

A principal who is about to introduce the study should be careful that the instructor he employs is competent.

Besides phonography, the following systems have at the present time (1888) adherents among professional shorthand writers practising in London:—Gurney's, Taylor's, Lewis's, and Mavor's, already referred to; and Purton's, which is supposed to have originated with William Purton, known to have been a schoolmaster in London in 1819.

Nearly two hundred systems have been published since 1837. Most of these have disappeared. But the great position which phonography has gained is now (1888) challenged by several authors. An active propaganda is carried on by J. M. Sloan, an adapter to English of the popular French system of Duployé, in which vowels and consonants are joined in their natural order. J. D. Everett, Professor of Natural Philosophy in Queen's College, Belfast, is the author of a system in which there is great representation of vowels. What may be termed the school of Alexander Melville Bell (1854), in which the presence or absence of vowels is inferred from the writing of the consonants, is represented by 'Legible Shorthand,' the invention of E. Pocknell, a London shorthand writer, and 'Audeography,' by F. Valpy. Of a cognate character is the system of A. M. Browne. A system by E. Guest represents the 'compendious' school. A. Janes's 'Shorthand without Complications' goes more upon the old lines, but it is noticeable as the first system in which thick and

thin characters have been combined in the alphabet with the 'looped' characters of Taylor. Script systems have been revived, and among authors who are working in this direction may be mentioned P. Kingsford, who entitles his method 'The Oxford Shorthand.' The general characteristic of the new systems, with the exception of Janes's, may be said to be the fuller representation, or indication, of vowels.

Sides. *See* MODERN SCHOOLS.

Singing has been defined as the use of the voice in accordance with the laws of music. This definition, however, lands us where we started from. A more practical definition would be given by saying that singing depends first on the utterance by the voice of sustained sounds, and second on the ordered relationship of these sounds in the musical scale. Between speech and song there is merely this difference, that in speech the voice is perpetually changing its pitch by minute and indefinite degrees, and in song the changes of pitch, however rapid, proceed by definite and measurable intervals. It is conjectured by Mr. Rowbotham, in his *History of Music*, that song is a survival of that language of cries which preceded speech in the history of mankind. Quite apart from the definite emotions raised by the words in song, there is an undefinable yet all compelling emotion which the voice itself kindles in us. This fact has led an ingenious American writer to speculate on the future of vocal music, and to assert that the coming singer will merely warble vowel sounds without any words. Such an issue is, however, impossible so long as speech retains its power in the world. We are provided in the music of artificial instruments with the vague and mystical aspect of music; what the singer does over and above this is to draw out our sympathy by his personality, and to direct our thoughts in fixed and common directions by the words he utters.

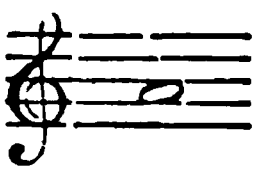
Physiologically, speaking and singing are the same act. The same nerve which, communicating with the brain, prompts the larynx when we speak, prompts it when we sing. It follows from this that every one who can speak can also sing, and in a general sense this is undoubtedly true. The statement, however, needs qualification. Just as the speaking voice in different people is harsh or mellifluous, so the singing voice varies from a rasping strain to smooth and easeful roundness. But in the power to command the various pitches required in song, to strike them accurately and sustain them on a perfect level, persons vary greatly. It is this power that is described as 'having an ear for music.' The gift is, indeed, far more general than is supposed. If dormant, it can be cultivated; it is trained in childhood more easily than in adult age; and the best authorities are of opinion that persons who are 'tone blind' are not more numerous than those who are 'colour blind.'

The value of singing in education arises from several causes. It is in the first place a healthy exercise. Dr. Affleck has said that if there were more singing there would be less coughing. Singing requires that deep respiration which in ordinary speech we seldom use. It causes a large quantity of air to be brought in contact with the lungs, and thus renews and purifies the blood. Deep breathing exercises are recommended by several American hygienists, and they are said to possess all the advantages which change of air brings. These exercises can be had, pleasantly and without formality, in the process of singing. The second function of singing in education is as a relief from severer studies. The localising of the brain functions enables us to understand how singing, appealing to another part of the mind, and to the whole nervous system through its rhythm and tone, performs the same function in school work which oil performs to a heated and labouring machine. It soothes and refreshes, indeed repairs, brain fag, and enables the pupil to return to studies which occupy the memory and the reason with a new supply of vital force. A third purpose in singing, especially with young children, is to store the memory pleasantly and without effort with a quantity of bracing and formative verse, calculated to strengthen the will and the principles of conduct, teaching patriotism, love to parents, kindness to the weak and suffering, to animals, and so on. The inculcation of religious principle through music is too obvious to need remark.

The teaching of singing in schools is in the fourth place important because it is the beginning and foundation of all musical study. This is a point on which

the late John Hullah was never tired of insisting. If you wish to learn the pianoforte, the violin, &c., he would say, learn first to sing. The reason of this is as follows. The difficulties of mastering an artificial musical instrument may be divided into two classes. First, we have to train the ear to recognise and imitate at will musical tones, to comprehend rhythm and measure, to feel and produce light and shade and phrasing, and to read musical notation. Second, we have to master the technicalities of the particular instrument, and to train the fingers quickly to obey the dictates of the eye and the mind. All the first class of subjects can be studied fully and most satisfactorily in the process of learning to sing. When this is done, and a pupil takes up an instrument, he will find that a great deal of the work which he thought was before him is really behind him. Much of the discord and halting which beginners upon instruments inflict on themselves and others are caused by their own mental uncertainty as to the tone or the time required. They are learning music and mechanism at the same time, instead of separating them. The pupil who begins an instrument having first learned to understand music and to read musical notation, makes far more rapid and satisfactory progress than one who is weighted with the double care we have described.

The first caution necessary for all teachers of singing, whether their pupils are adults or children, is that the voice must be gently used, because of its delicacy as an instrument. There is danger both in strain and in fatigue; in singing too loudly and in singing too long. We cannot say much, within the limits of the present article, on the physiology of the voice. The recent works by Lennox Browne and Behnke and by Sir Morell Mackenzie may be consulted by those who wish to master the subject. There is, no doubt, a tendency to overrate the importance of a knowledge of vocal physiology to the teacher of singing. The great end of the teacher is to produce pure and smooth tone, to develop the voice in power and control, to watch every sign of deterioration. As a rule, if the pupils sing naturally they will sing rightly. The registers of the voice are seldom misused except when the singing is too loud. Nasal and throaty tone, which arise from a wrong employment of the mouth and nostrils, can generally be corrected by the teacher's own judgment. As the voice ascends in pitch the larynx (the voice-box which is in all our throats) performs its functions in a different way, and the change of mechanism is called a change of register. The registers of girls' voices do not commonly trouble the teacher, but those of boys' need care. Boys speak in a stronger register than girls, and are prone to force that register upwards in singing beyond its proper limit. The lower register should not be used by boys above A, at which point they



should change into a softer and more fluty voice, which will be at once recognised by the teacher. At first this higher register is thin and weak, but practice strengthens it greatly. Boys' voices are naturally as high as girls, and if they find that an ordinary tune tires them it is in all probability because they are using the wrong register. The way to cure them of this is to pitch the tune in question a fourth or even a fifth higher, so that they are forced to employ and strengthen the higher register. In singing, the teeth must be fairly opened and the lips drawn open with them, but exaggeration should be avoided. The management of the breath is all important. It should be taken in by lowering the diaphragm and distending the ribs, not by raising the upper chest or collar-bone. Abdominal breathing is natural and powerful; collar-bone breathing is feeble and artificial. Standing is the true position for singing. This is proved by the spirometer, a little machine for testing the quantity of breath that can be drawn into, and consequently exhaled from, the lungs. The spirometer proves that the same person can inhale and retain most breath when standing, less when sitting, and still less when lying down. Let the pupils stand erectly, but not stiffly, when singing; they should assume the posture of 'stand at ease' of the soldier. Stooping to look at the music and bending over a book shared by another pupil are both bad. The pupils should sing from memory or from a blackboard or chart.

Failing these they must learn to hold their books without lowering their heads.

Boys and girls should never be allowed to sing during the period of mutation. The few—very few—writers on the subject who have given contrary advice have done so recklessly. There is a very powerful consensus of opinion against the use of the voice during this period. Dr. Stainer attributes the loss of his singing voice to the fact that he sang solos as a boy at St. Paul's Cathedral after he was sixteen years of age. The change in the girl's voice is so much less marked than in the boy's that it is liable to be overlooked. But there is always a time when the girl's voice becomes husky and veiled. Singing should then stop.

The common faults of singing flat and singing sharp give great trouble to teachers. They are especially observable when the singing is accompanied by an instrument. Both faults may be largely corrected by a study of the mental effects of the tones of the scale, which is part of the tonic sol-fa system (*q.v.*) According to this theory, when a scale or tune is sounding in the ear each tone of it impresses the mind with an individuality of its own. The pitch may be high or low, but the place of the tone in relation to its surrounding tones enables us to fix and recall it. The singer who feels tones in this way will strike them with certainty. The ear or dictation exercises, which are another part of the tonic sol-fa system, provide a second means of rendering the ear sensitive to musical intonation. From the first, tonic sol-fa pupils are taught not only to produce sounds for given notes, but inversely to produce notes for given sounds.

Singing sharp is a far less common fault than singing flat. It results from excess of energy and nervous excitement. The causes of flattening are various, and even the best singers and choirs are subject to it at times. It may be described as generally due to relaxation of interest and fatigue. Fresh air, change of posture, may help to cure it. Sometimes, if the fault is bad, the singing should cease, and some point of theory which does not involve singing be introduced. It is well to accustom the class to think about maintenance of pitch, even in their unaccompanied music, by sounding the key-note on a chromatic pitch-pipe or the pianoforte at the *close* as well as at the beginning of a piece. The wrong use of the registers, which we have already referred to, is also a fruitful cause of flattening, perhaps the most fruitful.

Clear pronunciation is an element of singing which is both important and sadly neglected. As we speak, so we sing, and by common consent the Englishman is a most slovenly speaker. The Scotch and the Welsh articulate better than we do. 'Our speech,' says Mr. H. C. Deacon, 'is carried on in smudges of sound.' And, as water cannot rise above its level, so pupils are not likely to pronounce better than their teacher. The teacher of singing must bear in mind that half of singing is elocution (*q.v.*) Good reciters and readers must be studied as models; there must be much self-searching for unconscious provincialisms, and an unceasing effort to sustain a high standard of pure vowels and articulated consonants in the singing of the pupils. Properly speaking we only sustain sound upon vowels, while consonants are ways of interrupting sound. But both being necessary for speech are associated with singing. While using the voice we must take breath according to the laws of elocution, and these sometimes contradict the laws of musical phrasing, which, in such cases, must invariably give way. Children need to take breath more often than adults, because of their smaller breath-capacity. It is, therefore, well to mark the breathing places in each verse of a song by the use of a pencil. The same faculty which helps the actor to declaim with feeling, serves the singer, who, while bound by the laws of musical intonation and rhythm, can nevertheless 'take liberties' with the length of notes and the expression, so as to throw into special emphasis strong words and phrases. When we sing in chorus these 'liberties' are less possible, because the whole mass must move together. Yet here much may be done, and the intelligent and heart-earnest teacher infuses life and impressiveness into the simplest song by changes from loud to soft, quick to slow, and the emphatic treatment of special words.

Songs accompanied by motions are much in favour in Kindergarten work. No one would wish to abolish these. They are greatly enjoyed by children, and teach them the expression of feelings and acts. But a word of caution must be given. The best position for the body while singing is

that of rest, and any departure from that increases the difficulty of singing. Violent motions, or singing in a fixed and strained position, should be avoided. (*See* SOL-FA-ING; TONIC SOL-FA; and MUSIC.)

Site of School. *See* ARCHITECTURE.

Sizar.—Formerly a poor student in the University of Cambridge, who received commons free, and in return performed some menial service. Now the sizarships, like the scholarships, are awarded by competitive examination, and the sizars hold similar positions to those of scholars. A sizar must, however, always prove his need of pecuniary assistance before he can be elected.

Sleep is necessary for the recuperation of the physical powers. The discharge of the functions of the body implies consumption of its structure. Hence a period of repose is required, during which this may be replaced. The only apparent exceptions are the heart and lungs, but these obey the universal law, only their rest is frequent and momentary, while that of other organs is at greater intervals and of longer duration. Apart from sleep, rest of any organ may be partially obtained by change of occupation. The importance of varying school-work, thus alternately exercising and resting different parts of the brain, cannot be exaggerated. Sleep, however, is the only form of complete and general rest. During sleep there is a diminished flow of blood through the brain, and the functional activity of its higher centres is abrogated. If a child eats and sleeps well, his brain can scarcely be overworked. Prolonged sleep, however, does not obviate the effects of excessive mental work. The work must be diminished, and more time allowed for recreation. The average amount of sleep required at 4 years old is 12 hours, at 7 years old 11 hours, at 9 years old 10½ hours, at 12 to 14 years old, 9 to 10 hours, at 14 to 21 years 9 hours. (*See* DORMITORIES.)

Slöjd, or Sloyd.—This name has been given to the system of manual training in force at Herr Otto Salomon's seminary for hand-work at Nääs, near Gothenburg, and from whence the system is spreading rapidly to many other countries than that of its birth. The etymology of the word slöjd may perhaps be discovered in the Swedish word *slug* = sly, shrewd, *slög* = handy, dexterous, whence slöjd, mechanical art, and sleight of hand. This system is now applied to many kinds of handwork used in schools and colleges for purposes of education. A list of the different kinds of slöyd practised in the schools of Sweden, Norway, and Denmark, is given in Miss Chapman's treatise on sloyd handwork as applied to the workmanship of metal, basket, cardboard, and fret-work, besides turning, wood-carving, painting, bookbinding, and carpentry, or wood slöyd. She claims that in Sweden no less than one-thousand national schools practise the art of wood sloyd, and that it has also been introduced into higher and secondary grade-schools in that country, into France, Belgium, Germany, Austria, and the United States. The difference between wood carpentry of the mechanic and artisan and that of the sloyd system lies not only in the character of the objects produced, but in the manner of work and tools used, and the special object of the system, which is the acquirement of manual dexterity, exercise of judgment and technical skill, development of the physique, gradual training of the pupil by a progressive series of work from simple to skilled workmanship.

Thus in the wood sloyd, the course of training begins with the production of some such simple article as a pointer, flower-stick, or penholder, no tool but the Swedish knife being permitted for this purpose; in the second stage the wood is prepared with a plane, and a square ruler or child's cubic toy brick is produced; in the third stage boring is introduced; in the fifth a spoke-shave is used in addition to a knife and plane, a bow-saw is perhaps added, and so on to a more advanced stage of workmanship in each case, till the intricacies of the system culminate in dovetailing, and advanced branches of the profession are thoroughly mastered. By these means the pupil is gradually led through a series of steps, in which hand, eye, brain, and judgment are equally exercised; and a sense of accuracy and perseverance, application, assiduity, and observation engendered, which could not be attained in any other way. There is no royal road to sloyd handwork, the steps are not climbed more hastily in this than in any other branch of handicraft, but the technical training thus commenced in early youth or childhood serves a useful purpose. The ready engagement by shop-keepers and others of youths who have been through the sloyd course in Sweden,

however, beginning to be practically admitted, especially in the 'useful institutions' of the Kindergarten order; but the distinction between the second and third ages of man, or between his memory age and his thinking age, is still wofully ignored by practical educators.

Again, Swedenborg, in one of his works, lays down the doctrine that 'sciences in general are nothing else than a means of forming a man's rational faculty,' and in another affirms that 'on our earth the sciences are means of opening the intellectual sight, which sight is in the light of heaven.' Such, therefore, from a New Church point of view, is the use of that knowledge which children and youth acquire at school and in colleges. 'It is a means for developing their rational, that is, their thinking powers, and thus a means for ascending from the second into the third story of the mind. This use of the sciences, and thus of the material of education, is at the present day universally ignored by our systems and methods of education. The memory is the only faculty in which man is appealed to in our schools and in our colleges,' and whilst the difference in the age of students is acknowledged in the choice of subjects which is made for younger and for older pupils, the method of instruction practically remains the same in all ages. 'And this one method is the method of learning by rote, which when intensified is called cramming.' It is owing to this unnatural method that the zeal for learning has to be quickened by prizes and scholarships. 'As the strength of a man's body depends upon his digestive powers, and not upon the size of his stomach, so also it is with the mind of man. It is not the cramming of his mental stomach, of his memory, with all sorts of knowledge which makes him an intelligent and a rational man, but it is his mode of digesting his knowledge. A little knowledge well digested, and raised from the second to the third story of a man's natural mind, goes a great deal farther in making him a useful citizen in this world than any amount of certificates showing that he has successfully crammed into his mind a given number of scientific subjects. The curse of our schools and of our whole age is the synthetic method of study which is universally followed to the exclusion of the natural method of instruction, the analytic, which is the

method by which children lea
mother-tongue.' In grammar, for
children have first to learn abst
the so-called parts of speech, and t
have to commit to memory rules
mar which they do not understand
an infant, by following and atte
the analytic or natural method of
tion, acquires a knowledge of its
tongue in less than a year, the w
cess of acquisition being an eas
playful enjoyment to him, the l
acquiring Greek and Latin, or Fr
German, becomes afterwards a
peculiar difficulty, and, on accour
perverseness of the method whic
lowed by the teachers generally,
guages thus acquired are always
less an artificial product in the m

To teach by the analytic metl
thus to develop the rational or
powers of the students, requires a t
knowledge of his subject on the
the teacher; and it will not do fo
be simply one or two lessons ahea
students. According to the analyti
of instruction a teacher is an edu
the highest sense of the word, and
by which he works is that of a bui
also of a gardener. An analytic
has before his mind's eye the whole
departments of learning which l
sirous of building up in the mind
students, or, rather, which he de
students to build up in their ow
with the help of their teacher.
the foundation first, and then cor
to build up first one branch of th
and then another, and he never
subject until he is fully satisfied
student thoroughly understands
analytic teacher never loses out
the New Church truth, that good ar
affection and thought, delight and
ledge, must ever be combined, in or
a subject may remain permanently
memory. While directing the a
of his students to knowledge, he i
fore, ever anxious to interest them
subject, that is, to arouse the affec
delight of knowing in their mind
same time. This, however, he
always adapting his instruction to
state of their mind; his instructi
be the continuation of somethin
they already know, and it must li
the grasp of their understandin
teacher, therefore, is always sure

in the technology of different departments of trade cognate to the one in which the workman is daily occupied. The foreman, who is generally selected from the more successful and better-informed workmen, may obtain his special training in evening technical schools; but it is also desirable that children from the elementary schools, showing aptitude for profiting by higher instruction, should be encouraged, by means of scholarships, to continue their education in higher schools, with a view of giving them the preliminary training which may qualify them to occupy more readily higher posts in industrial works. In these schools the instruction should be practical, and should consist mainly of physical science, mathematics, drawing, and further practice in the use of tools.

For those who are to take charge of manufacturing works, or who are to be engaged as engineers in constructive industry, the best training is that which may be obtained in a good secondary modern school, in which the teaching of science and modern languages is substituted for that of classics. This training should be supplemented by such higher technical instruction as is now provided in a technical institute or in special departments of some of our universities.

The two principal agencies in this country for the encouragement and direction of technical education are the Science and Art Department and the City and Guilds of London Institute. The Science and Art Department (*q.v.*) encourages, by means of grants on the results of the examinations of students, the formation of classes: (1) for the study of art and industrial design; (2) for the study of the different branches of science. The City and Guilds of London Institute is a voluntary association of some of the principal livery companies of London, who annually subscribe money for the advancement of technical education. The Institute was incorporated in the year 1880. It has established and maintains a technical college at Finsbury and a Central Institution at Kensington. The object of the Finsbury College is to afford evening instruction to

is the education of technical teachers and of young men preparing for any branch of engineering or manufacturing work. The Institute also encourages, after the manner of the Science and Art Department, the formation throughout the kingdom of classes in technology and in the application of science to different trades.

Ancient endowments, which are no longer applicable for the purposes for which they were originally intended, are now being applied by the Charity Commissioners to the establishment and maintenance of technical schools, especially evening schools, such as that in connection with the People's Palace; and private benevolence, assisted in many cases by contributions from the livery companies, and notably from the Clothworkers' Companies of London, has been the means of establishing technical colleges in different parts of the country, as well as university colleges in which the instruction largely partakes of a technical character. In 1887, a Bill was introduced into Parliament to confer powers upon local authorities to levy rates for the erection and maintenance of technical schools, and to enable the Science and Art Department to make grants on handicraft instruction in elementary schools; and although this Bill was dropped, owing mainly to the pressure of other business, it has this year (1888) been again introduced in an amended form, and is certain, should it become law, to facilitate the establishment of technical schools adapted to local wants. One of the many results of the demand for technical instruction has been the improvement in general education by the introduction into the different grades of schools, from the higher elementary school to the university, of the laboratory, the drawing-office, and the workshop.

Several attempts to legislate on this subject have been made, and three Bills for providing technical instruction have been introduced into the House of Commons. The first of these was the Bill brought in on July 19, 1887, by Sir W. Hart-Dyke on behalf of the Government. In this Bill it was proposed to give power

tion—viz. English as read, written, and spoken. This cannot be taught too thoroughly. (3) Latin. (4) French and German. Where practicable, it should be optional to substitute Spanish for Latin; or if Latin be not chosen, then higher instruction in French should take its place. (5) History and geography: (a) English history, together with the history of Scotland, Ireland, the United States, and the chief British colonies and dependencies;

first year or two. This comparatively long training, in what is really technical education for the clerkly craft, makes it necessary that youths should commence the practical part of their career as early as possible. Experience has proved that the best age is between fourteen and fifteen. There are some large firms in London who do not take juniors who are older than fifteen years. It therefore becomes urgent to provide for the requirements of this

to pass the ordinary local examination for junior or senior students. The regulations may be summarised as follows: (1) Writing a letter in English on some commercial subject; précis writing; shorthand, i.e. taking notes of a passage read, and then extending them verbatim. To pass, the student *must* satisfy the examiners in letter-writing and in précis writing. (2) Arithmetic with special reference to commercial problems—e.g. weights and measures in British dependencies and foreign countries; currencies and exchanges; book-keeping by double entry; algebra, including the Binomial Theorem, with positive integral indices, logarithms, and the application of algebra to calculations of interest and annuities. But no pass can be obtained unless the student satisfies the examiners in arithmetic. (3) Physical and commercial geography, with special knowledge of sea and land routes, centres of industry and products; English history from the reign of Queen Elizabeth, with special reference to the development of commerce. (4) Modern languages, French, German, Spanish, Italian. No books for study are set. In each language the student must write a commercial letter, translate from the language into English, and from English into the language; candidates cannot take both Spanish and Italian, but they may take both French and German. (5) Latin. (6) The elements of political economy with special reference to value, money, credit, banking, foreign trade, and foreign exchange. (7) English Literature.—The student is examined in a play or a book. (8) Elementary Science.—Organic and inorganic chemistry; mechanics, including hydrostatics and pneumatics; sound, heat, and light, and electricity and magnetism. (9) Geometrical and mechanical drawing. The first four sections are absolutely compulsory. Of the others not more than two can be taken. The defect in this scheme is that it ignores natural science. Physical science is not included in the necessary subjects. Moreover, it makes no provision for boys who must leave school and become junior clerks about their fourteenth year. Latin is an optional, not a compulsory subject. After obtaining the Cambridge 'Commercial Certificate,' the education of the young man of business

Dr. Wormell, a commercial college should provide 'for about one hundred and fifty students a two years' course in modern languages, actuary's work, features of foreign trade, &c.' Courses of lectures on the history and development of trade and tariffs, on economic science and statistical science, mercantile law, international law, and commercial geography, ought also to form part of the curriculum of such a college. But it must not be forgotten that the training of the commercial school will not make a boy a clever buyer and seller. It cannot teach him the work of the counting-house, the exchange, the wharf, or what commercial travellers call 'the road.' It can only prepare him for it, and give him the best possible equipment for a useful and practical career.

The offices of the National Association for the Promotion of Technical Education are at 14 Dean's Yard, Westminster.

Temperament.—By the temperament of a person we understand his natural complexion or bent of mind as fixed by his physical organisation. The common division of temperaments is a fourfold, viz. (1) the sanguine (full-blooded), warm, impressionable, and changeable in its moods; (2) phlegmatic (with abundance of phlegm), calm, deliberate, and persistent; (3) choleric (with abundance of bile), energetic, with prevailing objective attitude; and (4) melancholic (with black bile), sentimental, with tendency to subjectivity. This fourfold division has been handed down from ancient times, and, as its terminology suggests, is based on a crude and obsolete notion of the physical basis of mental dispositions. Nevertheless, it has been used as the starting-point in recent attempts to classify the leading facts of temperament. It is now recognised that the manifold individual differences of mental constitution are very incompletely described by this scheme. Ingenious attempts have been made by recent writers to group these by combining the four leading types in various ways. A truly scientific classification of mental peculiarities must set out with the radical psychological distinctions. Thus we have a well-marked contrast of temperament in the emotional or sensitive and the active constitution. With respect to the

scripts between ι and αι (itacism), and in Latin between v and b; e.g. in Sen. *Ep.* xcv. 54, the manuscripts have *jactavimus* for *jactabimus*. (2) *Wrong division* of words is very frequent in transcriptions from uncials (in which words were not divided), and especially in proper names; e.g. the manuscripts in Strabo, xi. 516, have corrupted τὴν ὑπὸ Στασάνορι Βακτριανήν into τὴν ὑποστᾶσαν ὄρει, and in Thuc. i. 61, ἐπὶ Στρέψαν into ἐπιστρεψάντες. So Seneca's derivation of 'philosophy' in *Ep.* lxxxi. 4 —*philosophia unde dicta sit, apparet: ipso enim nomine fatetur, quid amet*—is obscured by the reading of the manuscripts and Haase—*quidam et*. (3) *Confusion* of similar letters and words. To such confusion are due the words in the *Te Deum*, 'Make them to be numbered with thy saints'; *munerari* (rewarded), contained in all Latin manuscripts before 1492, was corrupted into *numerari* (numbered). Hence the constant confusion, even in the best editions, of *dirigo* and *derigo*, *describere* and *discribere*, &c. The numerous abbreviations, occurring with increasing frequency in later manuscripts, have been a most fertile source of errors; hence it is often difficult to tell whether we are to read ἀνθρώπους (men), or ἄνους (fools), or ὄνους (asses), all being written in nearly the same way. (4) *Transposition*; e.g. the Medicean manuscript of Virgil, *Georg.* ii. 356, ends an hexameter with *submoveret ipsa* for *sub vomere et ipsa*; and the first words of Livy, which Quintilian notes as part of an hexameter—*Facturusne operæ pretium sim* are transposed in our manuscripts into *Facturusne sim*. Sometimes whole lines are transposed or even omitted, generally through the similar ending of two lines (homœoteleuton). (5) *Omission* or *addition* of similar letters or syllables (homœoteleuton); e.g. in Velleius Paterculus, ii. 882, *Erat tunc urbis custodiis præpositus Mæcenas*, the manuscripts, by omitting *erat*, in consequence of *inierat*, the word before, apparently make the author guilty of an historical blunder. So in Sen. *De Tranq. An.* v. 5, *Dentatus aiebat malle esse se mortuum quam nequam vivere*, the manuscripts, by omitting *nequam*, bring a false accusation against Dentatus. On the other hand, in Heb. ix. 12, the Sinaitic manuscript repeats εἰς τὰ ἅγια twice; and in Hor. *Sat.* ii. 4. 11 terminations, e.g. Onomander, iv. 50, wrote καιόντων δὲ οἱ φύλακες πυρά; καιόντων, the old form of the imperative, was misunderstood, and is wrongly divided by the manuscripts into καὶ ὄντων; finally οἱ φύλακες has been assimilated to this by nearly all manuscripts, which write τῶν φυλάκων. (7) *Substitution of synonyms* through defective memory, e.g. in Matt. ix. 29, D has ὀμμάτων for ὀφθαλμῶν. This error is especially frequent in the Gospels, owing to reminiscences of parallel passages. (8) *Interpolation*, especially of glosses, or explanatory notes. This error, closely akin to the last, was largely aided by the fact that the margin was used both for corrections and notes, e.g. in Plut. *Alc.* 36, τῶν μισούντων Ἀλκιβιάδην Θρασύβουλος ἦν, where ἐχθρός, a gloss on τῶν μισούντων, has crept into the text, thus turning the whole passage into nonsense. The baptismal formula in Acts viii. 37, and the Doxology in Matt. vi. 13, are probably interpolations from liturgies. (9) *Corrections*, especially of difficult or unusual words or constructions, either by *omission*, as of δευτεροπρώτῳ in Luke vi. 1, or by *alteration*: thus the *Codex Puteanus* has altered Livy, xxii. 16, 4, *inter Formiana saxa* into *inter fortuna minas saxa*, and in Cicero *Pro Sest.* lxii. 130, *ad Numidici illius* has been corrected in the Paris manuscript first into *ad unum dicitius*, and later into *ad unum dicto citius*.

Textual criticism being, not an exact science, but a history of copyists' errors, general rules as to the probability of errors are liable to modification, since each scribe is liable to peculiar errors. We must, therefore, examine each manuscript to see what are its most frequent errors, starting from cases that are certain, and proceeding thence to probable cases. *Ceteris paribus*, an assumed reading will be probable, according as the manuscript's deviation from it can be traced to one of the foregoing classes of errors. Moreover, *ceteris paribus*, we must prefer (1) the *most difficult* reading: for scribes more often alter a reading to make it easier than to make it harder—hence the difficult δευτεροπρώτῳ in Luke vi. 1 is probably to be retained; (2) the *shortest* reading: for scribes rarely curtail, but often employ and insert notes—e.g. the quotation in Matt. xxvii. 35; (3) the reading which *explains* the origin of the

rose to be captain of the school. His was the last Montem.[1] At nineteen he entered King's College, Cambridge. He stuck close to reading under his 'coach,' Shilleto. He became Porson prizeman in 1843, B.A. in 1844, M.A. in 1847. It is said that had he been allowed to enter the examination for the first classical tripos he would have been one of the favourites of his year for the place of first classic. But as a King's man he was debarred from this. He was a born teacher; was willing to go to Eton as under-master when Goodford succeeded Hawtrey, but no vacancy occurred. He contested unsuccessfully the election to the Durham Grammar School. Unwilling to remain at Cambridge, being far from strong, and at the same time having determined upon taking orders, he went down to Gloucester, and was ordained to the curacy of St. James in that city in 1846. There his health gave way, his vicar died, and in 1847 he went to help his father as curate at Alford. Afterwards at Great Marlow, 1848–49, and Cookham Dean, 1850–51, he joined to a curate's work the taking of pupils. He always spoke of his work in the parish schools of Gloucester and at Alford as the best piece of training for masterhood he did. He went to Uppingham as head-master, September 10, 1853. On the 20th December following he married Miss C. Marie Koch, daughter of Herr K. J. Koch, a German lady of high accomplishment, whom he had met in Rome the previous year. He found at Uppingham a single boarding-house, an old school-room, a handful of boys, forty-three boarders and eighteen day scholars, and an usher to help him. He has left behind him the 'great school,' 'School Chapel,' a sanatorium, a gymnasium, a forge, a workshop, a swimming bath, eleven boarding-houses, a preparatory school, twelve fives-courts, two cricket grounds, an aviary and public garden, and ten acres of land for school purposes in addition. Under his head-mastership not less than 25,000*l.* of school property has been added to the trust, and not less than 90,000*l.* has been invested by the masters in school machinery and enterprise.

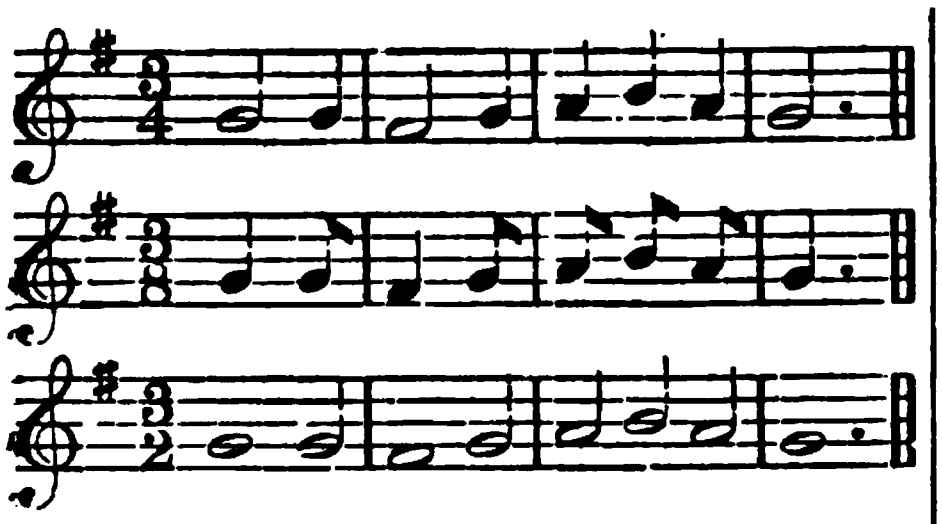
[1] Formerly the scholars of Eton had a custom of going every third year on Whit-Tuesday to a hillock

carrying the whole school, bag and baggage, to Borth, on the Welsh coast, and so saved the school's existence. A forcible preacher, and a poet, he is best known in America and England as the author of *Education and School*, 1st edition, 1864; 2nd edition, 1869; *Thoughts on Life Science*, 2nd edition, 1871; *The Theory and Practice of Teaching*, 1st edition, 1883; 2nd edition, 1885. Also four volumes of school sermons. Since his death have been published by Fisher Unwin, three vols. uniform: (1) *Poems and Translations*, (2) *Uppingham School Songs and Bootle Lyrics*, (3) *Addresses by Edward Thring*. An original thinker, his writings and addresses are packed with epigram and illustration. His greatness as a man lay in his spiritual idealism, his belief in the ultimate victory of truth, his fearlessness, and powers of self-sacrifice; as a teacher, in his assertion that education meant not cram, but character. He was the originator of the Annual Conference of Head-masters, and was honoured by all, as a leader, not of boys only, but of thought upon education, and the science of school life.

Tiberias (Schools of). *See* SCHOOLS OF ANTIQUITY, section Judea.

Tonic Sol-fa Method.—This term covers two things: (1) the musical notation of letters, punctuation marks, &c., and (2) the carefully ordered educational system, which is used in connection with the notation. Casual observers are often repelled by the sight of the Tonic Sol-fa notation, which seems to them perhaps wanting in graphic and picturesque force after the staff notation. They forget that the system depends largely for its success upon the principles of education which Pestalozzi, Froebel, and a host of others have laid down, and which are now universally approved.

The originator of the Tonic Sol-fa system was John Curwen (born in 1816, died in 1880), who was a Congregational minister, educated at University College, London, and very much occupied during all his life with educational problems. Mr. Curwen was not trained as a musician. He had no natural quickness of ear or voice, and taught himself to read music



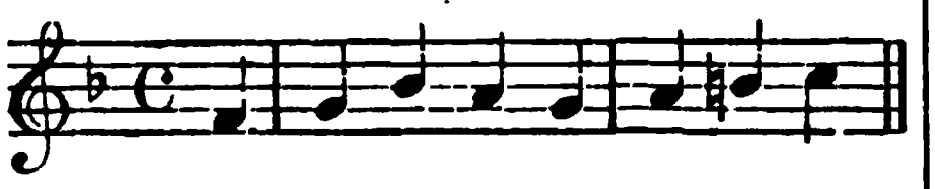
we have three ways of writing the same passage, difference of speed being the only qualification. In Tonic Sol-fa all three would be written

KEY G.

| d :— :d | t_1 :— :d | r :m :r | d :— :— ‖

and the rate of movement would be indicated by a metronome mark or an Italian word.

Change of Key, one of the commonest facts in music, is provided for in the Tonic Sol-fa system by shifting the pitch of doh. Thus, in the following phrase—



there is a change from F to C. This can either be expressed by the use of the chromatic syllable fe, already explained :—

KEY F.

:d | r :f | m :r | m :fe | s ‖

or it can be more perfectly shown by changing the doh, giving a double name to the fifth note :—

KEY G. C.t.

:d | r :f | m :^{r}s | l :t | d^1

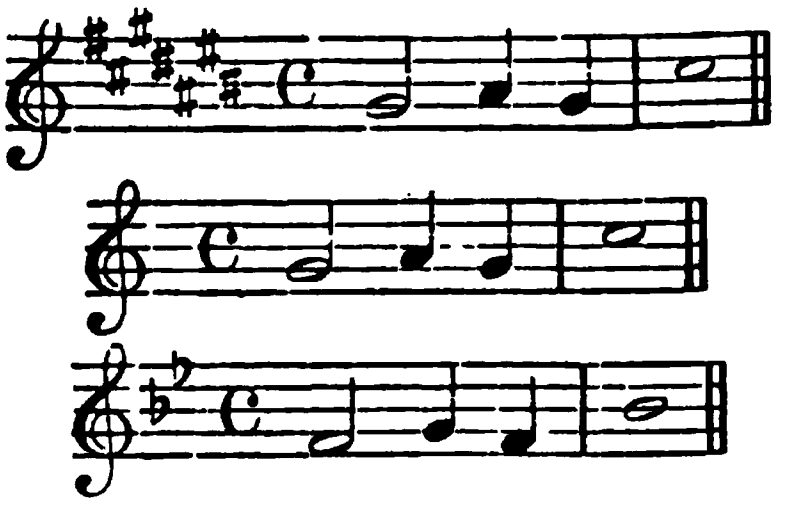
The words 'C.t.' over the mutation note indicate the name of the new key and the new note (t) which the change involves. This plan is applicable to the most distant changes—

KEY G. s.d.f. Bb.lah is G.

:d | m :r | d :t_1 | d.:—|—:$^{d}l_1$ | d :t_1 | l_1 :se_1 | l_1 :—|—‖

The notes s, d, f, being placed on the left, indicate that the change is in that direction on the extended modulator, a diagram which contains several scales side by side. 'Lah is G' reminds us that we are in the minor mode, of which G is the tonic.

The marks of expression used in Tonic Sol-fa are the same as in the old notation. The words are printed under the letters just as they are under the staff, with slurs if necessary. Undoubtedly the reason why the Tonic Sol-fa is so easy to sing from is because it is more graphic than the old notation. The mind conceives music chiefly by its key relationship, not by its absolute pitch. Thus in these cases



the immense majority, even of musically educated persons, hearing (not seeing) the notes, would say they were the same. The sense of relationship is infinitely more common and more vivid than that of absolute pitch. The Tonic Sol-fa notation puts to the front this relationship between notes, which is quite constant in all scales and keys. It confines attention to it. On the other hand, the staff notation gives directly the absolute pitch of a sound, and only indirectly its key relationship. To borrow the language of logicians, the staff notation denotes absolute pitch and connotes relative pitch, while the Tonic Sol-fa notation denotes relative pitch and connotes absolute pitch. This is the psychological basis of the new notation.

Mental Effects.—The sense of relationship between the tones, their individuality as part of a family, is rendered still more vivid by impressing the mind with the fact that each of the seven tones of the scale leaves a peculiar and characteristic impression on the mind. This was one of the most valuable and original of Mr. Curwen's doctrines. The characters which he gave to the tones were: Dóh, final, conclusive; Ray, rousing; Me, calm, peaceful; Fah, awe-inspiring; Soh, bold, rousing; Lah, plaintive; Te, piercing. These characteristics, however, are by no means to be taught dogmatically. The pupils are to be drawn to feel them by listening to fragments of melody sung by the teacher in which striking examples of

established a series of examinations consisting of practical tests, which, roughly speaking, may be taken during every six months of the learner's career. The lower examinations are, of course, easy, and are meant rather to sort the pupils, and re-classify them, than to give any public status to those who pass. The higher examinations are of the nature of diplomas.

Tonic Sol-fa College.—The authority which regulates all these examinations, and issues certificate cards and papers, is the Tonic Sol-fa College, Forest Gate, London. The secretary supplies details of the work of the correspondence classes, examinations, training classes, &c.

Musical authorities were formerly divided in their opinion as to the merits of the Tonic Sol-fa system. The leading musicians are, however, now agreed in its favour. Among those who have endorsed it are Sir Robert Stewart, Drs. Stainer and Bridge, Messrs. Barnby, Henry Leslie, E. H. Turpin, Brinley Richards, E. Prout, A. R. Gaul. The acousticians are all in its favour, including Lord Rayleigh, Mr. Bosanquet, Professor Helmholtz, Mr. A. J. Ellis, Mr. Ledley Taylor, &c. Professor Helmholtz speaks of it as 'the natural way of learning music.'

Sight Singing is rendered certain and easy by the Tonic Sol-fa notation. Tonic Sol-fa choirs have repeatedly read, all at first sight, in public compositions specially written for them by Sir G. A. Macfarren, Mr. Henry Leslie, &c. Tonic Sol-faists, also, according to the testimony of Mr. Stockley, choir-master of the Birmingham Musical Festival, and other authorities of equal weight, make better readers of the old notation than singers trained upon any other system.

Government Returns relating to elementary schools show that at the present time (1888) between 12,000 and 13,000 schools in the United Kingdom employ the Tonic Sol-fa system, while only about 2,000 employ the staff notation exclusively.

Nearly every choral work of importance is now issued in the Tonic Sol-fa notation. Music publishers usually issue a Sol-fa edition simultaneously with an old notation one of all their principal cantatas, oratorios, anthems, and part-songs. The leading choral works of Handel, Haydn, Mendelssohn, Beethoven, Mozart, Gounod, Sullivan, Mackenzie, are issued in Tonic Sol-fa.

Touch, Education of.—By the sense of touch, or the tactile sense, we mean sensibility to impressions of contact. This is possessed in a measure by all portions of the skin, but is found in its higher degrees only in particular regions, as the hands, and more especially the finger-tips, the lips, and the tip of the tongue. It is by this tactile sensibility that we distinguish degrees of pressure (when the hand is passive), also distinctness of points of pressure, as when we distinguish the two extremities of a pair of compasses brought close together and applied to the hands. With this passive sensibility of the skin, or tactile sense proper, is associated the so-called muscular sense. This term refers to the sensations we gain when we actively exercise our muscular organs, either by moving a limb, or by bringing pressure to bear on an object. This active function of the hand is of great importance to the child, not only as a means of doing things, and so realising his desires, but as a direct source of knowledge. The child comes to know the position, form, and size of objects by means of tactile discrimination of points supplemented by the muscular sensations which accompany the movements of the hand. Again, it learns about the hardness, elasticity, and weight of bodies, partly by its tactile sensations of pressure, partly by the experiences of muscular effort which it has in pressing, striking, lifting, &c. The psychologist regards the sense of touch as the fundamental sense, and more particularly as the avenue by which the child gains the root ideas of material things and their qualities. Much of what the eye in later life appears to see immediately is known in the first instance by the sense of touch (*see* EYE, CULTURE OF). This being so, it is evident that the sense of touch on its passive and its active side makes special claims on the attention of the educator in the first years of life. The utility to the child in the nursery of a variety of objects to touch, examine, and experiment with, is due to the important intellectual function of touch at this period. Pestalozzi and Froebel were the first to assign to the sense of touch its proper place in a practical scheme of training. The delicacy of touch reached by the blind and those whose special occupations involve an exceptional exercise of the sense, suggests that this last might, by a suitable series of exercises, be much more highly

touch would constitute one element in any improved system of hand and eye training which should serve as the basis of future technical skill. (*See* Bain, *Mental Science*, p. 43 and following; H. Spencer, *Education*, p. 72 and following; Sully, *Teacher's Handbook*, pp. 108 and following, 128, 151 and following; Pfisterer, *Päd. Psychologie*, p. 43 and following.)

Trade Guilds: their relation to Mediæval Education. *See* MIDDLE AGES (SCHOOLS OF).

Training of Teachers.—It was stated in the article on Pupil-Teachers (*q.v.*) that one object of the institution of the pupil-teacher system, in 1846, was to ensure a succession of well-trained teachers. By that system young men and women were attracted into the profession of elementary teaching as a means of livelihood at thirteen or fourteen years of age, and served an apprenticeship to it until eighteen years of age. The object above named would only have been partially secured if these young people, or the most efficient of them, were allowed to drift back into other callings at the expiration of their apprenticeship. Accordingly, the Committee of Council offered a considerable money inducement to ex-pupil-teachers to enter Training Colleges. This took the form of scholarships—Queen's Scholarships, as they were called—which consisted of payments of 20*l.* to 25*l.* a year for each pupil-teacher who passed a prescribed examination and entered a Training College. Substantial annual aid was also offered to the Training Colleges themselves which received these Queen's scholars.

This system, in its essential features, still prevails. The Education Department has ceased to make any payments direct to the Queen's scholar, but makes a grant on his behalf on a liberal scale to the Training College which accepts him as a student (charging him a small fee, not exceeding 20*l.* for a two years' course). This grant cannot exceed, on the whole, 75 per cent. of the expenditure of the college for all its students for the year, but may reach 50*l.* a year for each male, and 35*l.* for each female Queen's scholar. The course of training usually extends over two years, but may be terminated at the end of one year. The first effort to

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themselves so as to deserve an ordinary degree, or so as to deserve to be excused the general examination for the B.A. degree. The Tripos is usually taken at the end of the third year of residence, and, in order to equalise the competition, no candidate is allowed to enter who has kept more than eight full terms, or, in the case of the Mathematical Tripos, more than nine. The first part of the Classical and Natural Sciences may be taken at the end of the second year, i.e. in one's fifth or sixth term, but in that case it is necessary to take either the second part of the same Tripos or some other Tripos in the following year, in order to gain an honours degree. Special arrangements are also made for candidates wishing to take more than one Tripos, e.g. a candidate who has passed Part I. of the Mathematical Tripos may proceed to take Part II. of the Natural Sciences in the following year, &c.

The *Mathematical Tripos* is divided into two parts. Part I. extends over two periods of three days, there being an interval of eleven days between the two periods. In the first three days the examination is confined to the more elementary parts of pure mathematics and natural philosophy, including the first three sections of Newton's *Principia*, the subjects being treated without the use of differential calculus or the methods of analytical geometry. On the tenth day after this examination a list, in alphabetical order, is posted of those who have passed; those appearing on this list proceed to the second half of the examination, and, though they do nothing in the later papers, are entitled to an honours degree. The second half consists of six papers, including trigonometry, plane and spherical, analytical geometry, theory of equations, differential calculus, integral calculus, differential equations, dynamics of a particle and easier parts of rigid dynamics, optics, and spherical astronomy. Part II. is taken at the end of the fourth year, only those who have obtained honours in Part I being admitted. The candidate has a choice of eight divisions, in any two of which he is required to show proficiency in order to qualify for a first-class. The

The *Classical Tripos* was instituted in 1824; up till 1850 only those who had taken honours in mathematics were allowed to take the examination. Hence the impression, still prevailing, that classics are on a lower footing at Cambridge than mathematics. As reorganised in 1881, the Classical Tripos is divided into two parts. Part I. consists of four composition papers, in which passages from English authors are set for translation into Greek and Latin prose and verse, no original composition being required; two papers on Greek and Roman history, including literature and antiquities; two papers on grammar and criticism, including elementary philology; and five papers containing passages for translation from Greek and Latin authors into English. Part II., open only to candidates who have obtained honours in Part I., offers a choice of five sections: (*a*) language, (*b*) ancient philosophy, (*c*) ancient history and law, (*d*) archæology, (*e*) philology. Each candidate must pass in (*a*), which is the same as Part I., except that there is no verse composition, and may offer one or two (not more than two) of the other four sections.

Moral Sciences Tripos includes, first, general papers of a more elementary character in psychology, logic, and methodology, metaphysics, moral and political philosophy, political economy; secondly, more advanced papers on the above subjects and on the history of opinions relating thereto, certain alternatives being allowed.

Natural Sciences Tripos consists of two parts. Part I. includes papers of a more elementary character on chemistry, physics, mineralogy, geology, botany, zoology and comparative anatomy, human anatomy and physiology. For Part II. a thorough and complete knowledge of any two of the above sciences is required. In both parts the candidates' work is tested by a practical as well as a written examination.

The *Theological Tripos* is divided into two parts. Part I. consists of two general papers on the Old and New Testament, two papers on the Hebrew of the Old Testament, with questions in Hebrew grammar and easy Hebrew composition,

lapse to truancy it is revoked and the offender sent back. Experience, however, has proved that detention for a month or six weeks generally works a perfect cure; but it must be added that, except in the matter of attendance, the influence of a truant school is not invariably beneficial. Mixing with children all of whom are bad has, too often, a deteriorating effect upon the conduct.

Truthfulness. Untruthfulness.—Truthfulness or veracity has been regarded by moralists generally as one of the cardinal virtues. A scrupulous truthfulness, including the abhorrence of a lie, is one of the highest results of moral education. Lying is a common vice among children, as it is among backward races of mankind. It is very doubtful, however, whether it is a natural propensity which tends to display itself in all cases independently of circumstances. Much of childish inaccuracy of statement is not, strictly speaking, untruthfulness—that is, conscious or intentional misstatement—but is explained as the result of imperfect knowledge of words, and of a vivid imagination which momentarily confuses fiction and reality. A child properly brought up seems rather to show an instinctive shrinking from falsehood, and only lies as the result of an effort. The habit of untruthfulness may be induced not only by the bad example of untruthful companions, but by errors on the part of the parent or preceptor. Thus want of strict accuracy from a polite wish to please others may first suggest untruth to the child's mind Again, a child may be wrongly and foolishly accused of lying, and so the idea of falsehood forced on its attention. For the rest, the educator should be careful not to force and hurry a child into a lie when the temptation is great and likely to be overpowering, and especially not to terrify a child into untruth, but to encourage it to be perfectly open, even when it has something wrong to confess. When a lie has been clearly detected, it is a proper subject for punishment, and care must be taken to make this adequate, so as to correct the weakening effect of the first lie on a habit of truthfulness. Here, however, care is necessary. Lies differ greatly in turpitude according to their motive, and the lie that springs from fear of punishment ought not to be visited as heavily as one arising from a desire to gain an advantage over another, to involve another in trouble, and so forth. With respect to the best mode of punishment opinion differs. Corporal punishment is recommended by Beneke and others as most befitting liars. Again, Rousseau, Kant, and, more recently, H. Spencer, think that the natural consequence of a lie, viz. the withdrawal of trust, is the most appropriate form of punishment. Yet, as Jean Paul Richter points out, this is not always easy, for if we say we will believe nothing the child says, he will be apt to think that we ourselves are lying. Untruthfulness is emphatically a fault about which it may be said prevention is better than cure. The greatest care should be taken by the mother not only in her own use of words, but in the choice of servants and companions, so as to accustom the little one at the outset to the habit of truth, as something normal and admitting of no exception; and as the child grows, the influence of the home, the school, and of the playground should combine to develop a feeling of hatred and contempt for falsehood as something essentially mean and cowardly. (*See* Locke, *Thoughts*, §§ 131, 132, cf. § 37; Miss Edgeworth, *Practical Education*, chap. viii.; Mme. Necker, *L'Éducation*, livre iii. chap. iv.; and especially Beneke, *Erziehungs- und Unterrichtslehre*, § 65; also article 'Wahrhaftigkeit' in Schmidt's *Encyclopädie*.)

Tuition by Correspondence.—The system of correspondence-tuition is a noteworthy feature of modern education. At the time when university lectures and privileges were being thrown open to women it was thought advisable to devise some means by which unattached women students throughout the country could receive instruction for the university local examinations, whose advantages were also being extended to female students. To this end a committee was formed in connection with Newnham College, Cambridge, which was empowered to appoint teachers and prepare a syllabus of work to be done in this direction. Pupils were not slow to appreciate such advantages as now offered, and very soon a large number of women and girls availed themselves of these privileges. From Cambridge the system extended elsewhere, and comprehended not only female but male students in its correspondence-classes. The organisation and method were well adapted to the wants of this ever-increasing body

of earnest workers. Tuition was afforded, either with a view to immediate passing of examinations, or for the simple advancement of private study, in some one or more branches of knowledge. A syllabus was issued, which not only gave a list of subjects included in its curriculum, but also directed intending students as to the best methods of obtaining the full advantage of the new system. Moreover, books which might not have come within their notice were specially dwelt upon, a students' library was established, and a loan office in connection with the women's colleges extended its benefits to members of correspondence-classes. And what was done at Cambridge is only a type of what has since been done elsewhere. One single staff in the north now numbers some five or six hundred students in its correspondence-classes, to whose share not a few university distinctions and scholarships have already fallen. The instruction afforded is generally at a much lower cost than that applied to aural students of the same standard. The method which has brought the system to its present state of perfection is simply this: When once the subjects of work are selected by the student a number of questions are sent out bearing upon his present efficiency and future needs; generally what is called a 'test-paper' is sent to sound his educational standard, and a number of directions as to the precise line of work he is to follow. Thenceforward a series of questions and answers covering the ground about to be worked are sent and received periodically by correspondence-tutor and pupil, the answers being duly commented upon, corrected, and returned, together with very numerous hints and notes. The student is further advised as to the best books, as to special points of weakness in his work; and he learns to condense his thoughts *by continually writing out his answers*, and this latter is the keystone of all correspondence-tuition work. Not unfrequently books are freely lent, and the teacher being generally fully acquainted with the newest and best methods of educational work, is able to afford valuable assistance to isolated students. Further, sympathy is afforded, which is such an incentive to the solitary worker, and a ready referee is always at hand to solve difficulties and give encouragement in those times of depression too well known to solitary students. In many correspondence-classes excellent lectures are from time to time circulated, also annotated books of reference, notes on syntax, grammar, and construction, quotations, problems fully worked out, which serve as examples; and students thus benefit by the research of men and women who have access to fuller sources of information than they themselves possess.

A large number of correspondence-tutors are called upon to give information on many points outside their curriculum; and more than one staff habitually gives information, not only on educational matters, but on students' lodgings, registries, associations, and facilities of all kinds. Another large London staff affords *gratuitous* assistance in correspondence-tuition to *poor* women and girls, thus providing a long-felt want in the student world. The *Women's Year-Book of Work* gives an ever-increasing list of correspondence-classes specially intended for women; while the list of honours obtained by both men and women through this medium swells year by year. Both amateur and professional art, music, and mechanical students make use of this system. Correspondence-tuition will probably be an important factor in future educational schemes when restriction as to residence will be more or less withdrawn, and university certificates, diplomas, and degrees even more sought after than they are at present. Of course such a project as that of correspondence-tuition has not been entirely without flaws, nor has it been perfected at a single stroke; it is also liable, as are all newly-organised things, to misuse or misconstruction; neither are all teachers on this system more perfect or immaculate than those in other branches of their profession. The ever-increasing sphere of work attached to the post of correspondence-tutor is an earnest of the work to be done, and when the registration of teachers is made law in England as in other countries we shall hear less of attempted misuse of correspondence classes.

Turnebus. *See* REFORMATION.

Tutor.—This word no longer signifies one who merely 'looks after, watches, takes care of,' as its derivation implies (Latin *tueor*), but is employed to designate those engaged in certain kinds of teaching, or, as it is frequently called, 'tutorial' work, the change from 'guardian' to

word 'pupil' from 'ward' to 'taught,' both words being still used in Scotch law with their primitive meanings.

College Tutors.—At Cambridge the word has kept a good deal of its original force. Each college or hall has its tutor (or, in the case of the larger colleges, more than one), whose duties are (*a*) to maintain discipline, and organise the teaching arrangements of the college; (*b*) to assist in the work of imparting knowledge. In theory he is supposed to stand *in loco parentis* to the undergraduates of the college, or, when there is, as at St. John's and Trinity, more than one college tutor, to those assigned to his care. The tutor's advice and assistance in all matters connected with the undergraduate's studies or conduct is at the latter's service whenever he may need it in the course of his college career. The tutor's authority is large, and his duties onerous, but these are usually shared with others appointed to aid him, under the titles of assistant-tutors, lecturers, deans, &c.

At Oxford the word is applied in a somewhat wider sense, not only to those entrusted with disciplinary functions, but also to others whose work is solely to impart instruction. But at Oxford, as at Cambridge, each student on entering the university is assigned to a tutor, to whom he is supposed to come for instruction and advice when he requires it, and he cannot leave the university for a day, nor enter his name for any college or university examination, without his tutor's permission; but the relation between tutor and student is considerably closer at Cambridge than at Oxford. At both universities the tutors are, as a rule, also Fellows.

At many of the American and Scotch universities, and at various other colleges of university rank, the name tutor (or lecturer) is applied to the professor's assistant; as a rule, his functions are similar to those of the professor, but he generally takes work of a more elementary kind; sometimes, however (as at several of the theological colleges), he has disciplinary duties in addition.

Tutors (Private, at the Universities).—It is found, however, that the amount of teaching supplied by the college officials men who themselves have taken high honours in the particular branch of study in which they 'coach' pupils; they are frequently young men who find it to their advantage to take this irregular sort of work for a few years, before settling down to permanent engagements. There are, however, some who devote themselves entirely to coaching, especially among the numerous body at each university who prepare men for pass-degrees; but this latter is work of a disagreeable kind, as the pupils are generally men of little ability.

At *London University* there are neither professors nor tutors who have any official connection with the university, but there is a large body of private tutors who prepare men for the various examinations.

Tutors (Army, Civil Service, &c.).—The name tutor is also applied to 'crammers,' or 'coaches,' who prepare for the numerous public examinations. This class has sprung up within the last few years, and, in consequence of the increasing number of public appointments thrown open to competition, has assumed very large dimensions. In London the heads of these establishments are able to secure first-class men as lecturers, and consequently the fees charged by these tutors (notably the army ones) are very high; their pupils come mostly from the wealthier classes; but there would seem to be no need of this class of tutors if the great public schools, whence they draw most of their supplies, did their work more thoroughly.

Tutors (Private, Visiting, Travelling, &c.).—Visiting private tutors give instruction to pupils, on whom they call at the pupil's residence; wealthier families frequently employ *resident* tutors to prepare their sons for school life, and many men of considerable attainments are not loth to accept travelling tutorships, where their functions are to accompany their charges and exercise the double duties of mental and moral training. Such tutorships are nowadays mostly confined to the longer vacations, but at the time when the *grand tour* was looked upon as an essential part of the education of every young man of consideration it was a common thing for poorer men who had distinguished themselves at

ference of time is $98 \times 4 = 392$ min. $= 6^h\ 32^m$, which $+ 10^h = 16^h\ 32^m$. This means that the time required is $16^h\ 32^m$ P.M. or $6^h\ 32^m$ A.M. The convenience of the astronomical system of twenty-four hours is obvious and is coming into greater use. The International Congress at Washington agreed to count the Greenwich meridian as zero, and the time from Greenwich at midnight. Thus 19 o'clock at Greenwich would be, as it were, 17 P.M. all over the world (*see* MATHEMATICAL GEOGRAPHY). The mean solar *second* is the $\frac{1}{86400}$th equal part of the average length of a solar day. It is the $\frac{1}{31556925}$th of a solar year, and the $\frac{1}{31558150}$th of a sidereal year. The pendulum which ticks *seconds* at Greenwich has a 'length' of 39·139 inches, or 99·414 centimetres.

The teacher should take great pains with this difficult subject of units. Very many popular science text-books grossly offend in this matter, especially in elementary mechanics. Legal, popular, and scientific units should be distinguished in some cases. International units are being arranged or corrected. An important book of reference, the result of ten years' work at the request of the International Meteorological Congress, are the *Tables* edited by Profs. Mascart and Wild (Paris, Gauthier-Villars, 400 pp. 4to, price 35 francs). *See* also Tables of the *Physical Constants of Nature* (Washington, Smithsonian Institute). A useful little book on units, full of tables, is Lupton's *Numerical Tables and Constants in Elementary Science* (Macmillan, 1884, 2*s*. 6*d*.) *See* also Mr. Lupton's two papers in *Nature*, January 1888. Scientific units are dealt with in Prof. Everett's *Units of Physical Measurement* (Macmillan, 4*s*. 6*d*.) A larger book by an American is Jackson's *Modern Metrology* (London, Crosby Lockwood & Co., 1882).

Universal Language. — Many attempts have been made at different times to invent a means of communication which might obviate the necessity of persons of different nations learning one another's tongue. Latin may fairly be said to have been the 'universal language' of the lettered portion of the community during

One of the first attempts to supply a common medium was that of George Dalgarno, a native of Aberdeen and student of Oxford, whose *Ars Signorum, sive Character Universalis* appeared at London in 1661 and formed the basis of the better known work of Bishop Wilkins, *An Essay towards a Philosophical Language*, printed for the Royal Society in 1668. The bishop tells us (in his preface) that his main object is 'the distinct expression of all things and notions that fall under discourse . . .' and to attain that end he divides all words into *integrals* and *transcendentals*; his integrals (which comprise all nouns, &c.) he then divides into forty *genus's* (the expression is his own), which he again subdivides into *species*, &c. &c.; his transcendentals—which are to embrace all such words as are non-integrals—have to submit to a more complicated classification, and finally the whole arrangement (which, be it noted, must comprehend every single word in the language) is to be committed to memory before the 'Philosophical Language' can be used! Under these circumstances, it is perhaps not very surprising that Bishop Wilkins's scheme has never been put into practice: indeed it is doubtful whether anybody but the author of the system and his critics has ever had the patience to plod through the long dreary folio with its wearisome list of words 'philosophically' arranged, and its ingeniously cumbrous methods for the better concealment of thought. Perhaps one example of his system may be of interest. He names one of his *genera*, *Element*: to this he affixes the symbol *De*—then *Deb* signifies what he calls the *first difference*, which (according to the tables) is *fire*; *Deba* the first *species*, i.e. *flame*; *Det*, the fifth *difference* (of that genus), viz. *Appearing meteor*; *Deta*, the *first species* thereof, i.e. *Rainbow*, and *Deta* the second, *Halo*, &c. To write this 'Philosophical Language' he invented a 'Philosophical Character,' which is extremely difficult to learn, and ill-suited for either writing or printing.

But Wilkins's attempt excited much interest, and was the cause of many other experiments in the same direction. J. G.

for the plural add *s* to
case of the singular, e.g

Sing.	Nom.	Vol (Worl
	Gen.	Vola
	Dat.	Vole
	Acc.	Voli
Sing.	Nom.	Ob (I)
	Gen.	Oba (mi
	Dat.	Obe (to
	Acc.	Obi (me

There is, of co
gender for nouns n
need no inflexion,
follow the noun t
gives rise to an ad
of -ik, e.g. vol-ik
adverbs are adjec
termination -o, (
(*nocturnal*), nei
(*nocturnally*).
is denoted by th
pronoun, tense,
moreover, ever
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to hesitate as t
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The follo
scheme :—

Infinitive köm-
Perfect Part. e
Indicative Pre

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of the diocese in which it was located. On the overthrow of the supremacy of the papacy at the Reformation the universities lost their cosmopolitan character and became national or merely provincial. The gradual disuse of the Latin language in the class-rooms still further tended to isolate them from one another, and to lessen the migration of scholars from the universities of one country to those of another.

It was long the custom to carry back the origin of universities to a fabulous antiquity; but the legendary nature of the claims formerly put forth on behalf of the antiquity of such universities as Bologna, Paris, Oxford, and Cambridge has now been demonstrated, and the researches of competent scholars are gradually placing academic history on a thoroughly scientific and trustworthy basis. Passing over what have been called the universities of classical antiquity, Italy appears to have been the cradle of the mediæval and modern university systems. At all events there appears to have been an institution at Salerno as early as the ninth century, having strong claims to be regarded as at least a rudimentary university. The earliest documentary evidence, however, of a satisfactory nature regarding the existence of such institutions dates from the close of the twelfth century. It is scarcely possible to determine with exactness the relative antiquity of the oldest universities. None of them was founded by a special act of any individual or community; they all grew out of pre-existing educational institutions, but at what particular time they ceased to be schools and developed into universities is a problem exceedingly difficult to solve.

Looked at as a whole, the European universities present comparatively few points of contrast. They differ from each other in many minor details, but in the main they follow the same lines and seek to attain the same results. Their main object is to furnish a liberal education in the most advanced branches of knowledge to young men who have to some extent proved their fitness to profit by such instruction by previous examinations. This instruction is designed to promote intelligence and culture, and to qualify men for the learned professions. They seek also to encourage, so far as their respective endowments permit, the prosecution of original research by men of exceptional ability after they have passed through the ordinary curriculum and taken their degree; and in this connection they establish libraries, museums, laboratories, and other agencies, with a view of affording facilities for increasing and perpetuating knowledge. And they further bestow rewards in the shape of titles and degrees, not only upon meritorious students before leaving their walls, but upon all who distinguish themselves in their respective professions or who make valuable contributions to literature and science.

Until the second quarter of the nineteenth century university education in England was centred in *Oxford and Cambridge*. While in other countries universities sprang up in most of the principal towns, and thus brought a university training within reach of the great bulk of the people, Englishmen were forced at much cost and inconvenience to send their sons to Oxford and Cambridge, or abandon the idea of giving them a university education altogether. One characteristic which at once distinguishes these universities from those of other countries is the great extent to which the college system has been carried on in them. Originally intended as feeders of the universities, they in course of time greatly exceeded them in wealth, and almost altogether superseded them as teaching bodies. The great wealth which gradually accumulated in these colleges from the donations of pious benefactors, while a source of undoubted strength, was at the same time the generator of many of the weaknesses which so long hampered their usefulness. The extreme conservatism displayed all through their history also tended to the perpetuation of numerous abuses and to making their methods and subjects of instruction lag far behind the actual requirements of the country. But since the public interest in university education was fairly aroused by the discussions connected with the erection of the University of London, the older universities have been subjected to much criticism as well as to legislative interference on the part of the Government. For some years they have been passing through a period of transition amounting almost to a revolution. Opinions still differ as to the wisdom of many of these changes, but the general result has unquestionably been beneficial both to the universities themselves and to

the country. One of the most striking defects of the Oxford and Cambridge system has been its exclusiveness, and inability to meet the wants of all classes. This, however, has to a large extent been remedied, and the number of students has consequently steadily increased, although the percentage is still lower than it might be. These universities are now open, without respect of birth, age, or creed, to all persons who can produce evidence that they are likely to derive educational advantage from their membership; and every member is eligible to compete for all their prizes and distinctions, subject only to the necessary limitations of academical standing. The only restricted degrees are those in divinity, which are confined to members of the Church of England. There is a decreasing display of wealth among the undergraduates, and it is now possible for a student to live unattached to any college in a frugal manner without losing the respect of his richer associates. A general feeling in favour of economy has of late years been steadily growing, and the authorities of most colleges make every effort to promote simplicity of living and to provide for poorer students. Notwithstanding this, an Oxford or Cambridge career is still far from being inexpensive. The undergraduate who wishes to live in comfort and to enjoy a few luxuries must reckon on spending from 175*l.* to 200*l.* a year at Oxford, and from 120*l.* to 150*l.* at Cambridge. Many men of course contrive to live upon much less, but they are obliged to deny themselves many of those social amenities which are an important factor in academical culture. This influx of the plebeian element, which was so much dreaded in some quarters, has had no detrimental effect upon undergraduate life. Indeed, the tastes of the students as a whole are more refined and their manners more gentle than they were fifty years ago. The relations of the universities to the general educational system of the country are becoming closer every year. Their local examinations, conducted at different centres, their extension lectures, and their recognition of the claims of women to the highest educational training, have brought them more and more into contact with the people. These and other results of recent legislation, as well as of the voluntary action of the universities themselves, have undoubtedly tended to make them more truly national, and they probably never at any previous period exercised a greater intellectual influence over the whole country than they do now.

The government of the *University of Oxford* is vested in the following bodies: (1) Convocation, which consists of all the members of the university who have taken the degrees of M.A., M.D., D.C.L., or D.D., whether resident or not; (2) the Congregation, which consists of certain *ex officio* members and of all members of Convocation who reside in Oxford for 140 days in the academical year; and (3) the Hebdomadal Council, which consists of the chancellor, the vice-chancellor, the ex-vice-chancellor, for a certain period after the expiry of his term of office, the two proctors, and eighteen members elected by the Congregation. The Hebdomadal Council alone has the power of initiating legislation. A new statute framed by it must be promulgated in the Congregation, which may adopt, reject, or amend it. In its approved form it must be submitted to Convocation, which may adopt or reject but cannot amend it. Besides confirming or rejecting statutes submitted to it, Convocation transacts much of the ordinary business of the university by means of decrees; confers honorary degrees, and degrees granted by decree or diploma; sanctions petitions to Parliament; authorises the affixing of the university seal when necessary; and its members elect the university representatives in Parliament. But no proposals can be made to Convocation which have not been sanctioned by the Hebdomadal Council. The chancellor of the university being non-resident, the executive power of the university is chiefly in the hands of the vice-chancellor, who is nominated by the chancellor from among the heads of colleges, and usually holds office for four years. The vice-chancellor is assisted in his duties by the proctors, who are annually elected by the colleges and halls in rotation; and by various committees appointed by the three governing bodies. The university is a body corporate, invested, in addition to the usual powers of corporations, with various peculiar privileges, such as the right of exercising jurisdiction, civil and criminal, over its members, the right of returning two representatives to the House of Commons, and the power of conferring degrees. The

into two classes : (1) graduates, numbering upwards of eight thousand, and (2) undergraduates, numbering about three thousand. Only a small proportion of the graduates are in residence, and these are chiefly engaged in the educational work of the university or in research. The non-resident graduates are those who have left Oxford after taking their degree, but have retained their position as members of the university by the payment of certain dues. Only those members who have taken a degree qualifying for membership of Convocation have a share in the government of the university.

The colleges are also corporate bodies, and, as such, are distinct from the university, and independent of its laws and regulations. They manage their own property and elect their own officers, and the university proctors have no power within their walls. On the other hand, an intimate and harmonious relation between the university and the colleges is maintained by the fact that the great majority of the members of the university belong to the colleges, and that all who belong to the various colleges are at the same time members of the university. The colleges were originally founded for the maintenance of a limited number of members, consisting, as a rule, of the head, the fellows, and the scholars, and sometimes a few other members with various titles ; but it is now the custom to regard as members of a college not only the persons who are on its foundation but all members of the university whose names are on the college books. The duty of ascertaining the fitness of candidates for admission to the university is in the hands of the colleges, and it is by them that scholarships and exhibitions are offered to those who are beginning or intending to begin their university course.

The number of scholarships, exhibitions, and other endowments attached to the various colleges is very large. Scholarships are usually tenable for two years in the first instance, but this period may be extended to four or even to five years. They are partly open and partly restricted to students from particular schools or localities. The annual value of open scholarships was fixed by the University Commissioners of 1877 not to exceed 80*l*., inclusive of all privileges and allowances.

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in many colleges special funds fo
creasing the value of scholarships
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College fellowships are of two ki
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The following is a list of the twe
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with the reputed dates of their foun
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1887. In addition to the colleges there
two academical halls, St. Mary, founde
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of the colleges, inasmuch as they are
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scheme being that the Imperial University alone possessed the right of teaching. Superior instruction was given by the Faculties, which took the place of the old provincial universities. No establishment for instruction of any kind could be formed outside the University and without the authority of its chief. To open a school and teach publicly it was necessary to be a member and a graduate of the University. This unique organisation has been greatly modified by repeated acts of legislation, but its general outline has not been essentially altered. In 1876, however, it became possible for the Roman Catholic Church to establish denominational universities; and by the decree of December 28, 1885, concerning the organisation of the faculties and the schools for superior instruction, the University of Paris has been again revived. It embraces the faculties of Protestant theology, law, medicine, science, and letters, together with the school of pharmacy, and claims to be the most numerously attended university in the world. The following are the statistics of attendance during its first session, 1885–86: faculty of theology 35, law 3,786, medicine 3,696, sciences 467, letters 928, pharmacy 1,767—total 10,679. This total is not quite accurate, as a number of students are enrolled in more than one faculty, but the exact number is believed to be not less than 10,000. There were foreign students in all the faculties; and in the faculties of medicine, law, sciences, and letters there were in all 167

WURZEL.

German Universities.—Nowhere have more thought and pains been taken for the development of a university system than in Germany. No people take more pride in their universities than the Germans, and certainly no Government has been more liberal towards such institutions than the German. The German universities have thus reached a high degree of perfection, and their methods have been closely followed in other countries. The educational system of Germany resembles a vast and highly-organised machine, every part of which tells on the other, and the popularity of the universities is so great and the cost of attending them so cheap

caution young men who were leaving them against entering a university, as the chances of obtaining employment in the civil service were extremely small. The faculty of law is especially overcrowded. From 1860 to 1875 every student of philology was sure of an appointment on leaving the university, but now they have to wait as long as law students. In Germany the university is the recognised medium of admission to all the learned professions and all important offices of State. While largely engaged in purely theoretical training, tending to the over-production of specialists in every department of knowledge, the German universities also give direct professional training, enabling men to become lawyers, judges, schoolmasters, physicians, and clergymen. The watchwords of the German system are 'freedom of teaching' and 'freedom of learning.' There is practically no curriculum, and a student passes during his academic course from one university to another in a way scarcely known in other countries. The number of universities throughout the empire is 22. Of these the largest in point of numbers is Berlin and the smallest Braunsberg. The following are some of the statistics of the winter session, 1886–87: Berlin 296 teachers, 6,880 students; Leipzig 180 teachers, 3,3[illegible] students; Munich 165 teachers, 3,2[illegible] students; Halle 110 teachers, 1,583 students; Würtzburg 71 teachers, 1,5[illegible] students; Breslau 131 teachers, 1,4[illegible] students.

The Universities of Switzerland and Austria closely resemble those of Germany. The largest of these is Vienna, which the winter session of 1886–87 had 3[illegible] teachers and 6,157 students. The Hungarian universities of Budapest and Klausenberg have likewise a similar organisation. The former was attended in 1885 by 3,445 students during the first session and 3,255 during the second; the latter by about 500 students, there being a slight increase in session 1886–87.

Belgian Universities. — In Belgium there are State universities at Ghent and Liège, and independent universities at Brussels and Louvain. The University

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September 1 to December 2
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medical faculty had 313,
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Russian Universitie

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select any three schools he pleases. There is absolutely no restriction upon his choice but that necessarily imposed by the schedule of lecture hours. In this way 'freedom of learning' is also secured. Subsidiary to the titled degrees there is attached to each school the degree of graduate in that school, to obtain which a rigorous examination must be passed, and at least three-fourths of the total available marks secured. The degree of M.A. is conferred upon candidates who have in this way 'graduated' in Latin, Greek, French, German, moral philosophy, pure mathematics, natural philosophy, and chemistry.

Canadian Universities. — In Canada the American system of denominational college-universities largely prevails, but a scheme of federation has been recently under discussion, which is expected to issue in the grouping together of most of the existing universities. In the province of Ontario alone there are at present six universities, viz. (1) the University of Toronto, projected in 1798 and chartered in 1827, but for want of sufficient endowment not opened until 1843; (2) the University of Victoria College, Coburg, founded in 1832, and opened in 1841; (3) the University of Queen's College, Kingston, projected in 1839, incorporated in 1841, and opened in 1843; (4) the University of Trinity College, Toronto, founded in 1851, and opened in 1852; (5) the University of Ottawa, founded in 1848, and opened in 1866; (6) the Western University, London, founded in 1877, and opened in 1878. The University of Toronto was by its foundation charter virtually placed under control of the Episcopal Church. This circumstance led to a fierce controversy in Upper Canada, and the charter was subsequently modified in deference to public opinion; but it was not until 1849 that a law was passed under which the university became a purely national institution and free from denominational control. This change largely increased the popularity of the university, and it is now in a highly efficient state. Under the new statutes the University of Toronto became an examining body only, which prescribes the requirements for degrees, scholarships, and prizes; appoints examiners, and confers degrees in the faculties of law, medicine, and arts, and in civil engineering. The teaching institution is University College, with which the university is incorporated. Women are admitted to the college lectures as well as to the university examinations. The University of Victoria College at Coburg originated with the Wesleyan Methodists, and was the first institution of the kind established by royal charter unconnected with the Church of England throughout the British colonies. It has been administered with conspicuous ability, and has taken high rank among the Ontarian universities. Queen's College and University at Kingston is a Presbyterian foundation. It opened with eleven students only, and for many years had a chequered, and at times precarious, existence. Its financial condition, however, has considerably improved, and in recent years new buildings have been provided and the teaching staff has been increased. There are faculties of arts, theology, and law, attended by a total of about two hundred students. The University of Trinity College, Toronto, is in connection with the Church of England, and had its origin in the nationalisation of the University of Toronto, which included the suppression of the faculty of divinity. The university embraces faculties of arts and divinity, together with an affiliated medical school and women's medical college. The course of study for women was established in 1883; and candidates who may pass any of the university examinations are entitled to receive certificates, but they are not admitted to degrees. One of the distinguishing features of the college curriculum is the place assigned to theology as an art subject, including an honours course in that department. The University of Ottawa is under the direction of the Roman Catholic Church. It confers degrees in arts, science, and literature, and has a total of about three hundred students. The classical course lasts seven years, and the commercial course four years. The Western University at London, the latest addition to the Ontarian universities, is an institution in connection with the Church of England in Canada, and is empowered to confer degrees in arts, medicine, law, and divinity, subject to certain conditions contained in the act of incorporation. Huron College, a similar Church of England institution, has been incorporated with it, and forms its faculty of divinity. It is a small and tentative institution, its absorption into a larger university system being

specially provided for in its constitution. In the province of Quebec there are three universities. The principal of these is the M'Gill University at Montreal, which received its first charter in 1821, and an amended one in 1852. The university itself is an examining body, all educational work being carried on in M'Gill College and in the affiliated colleges and schools. Its statutes and regulations are framed on the most liberal principles, with a view to affording to all classes the greatest possible facilities for the attainment of mental culture and professional training. It embraces the faculties of arts, applied science, law, and medicine, and the usual degrees are granted in each. A new building for the medical faculty was opened in 1885, which has the reputation of being one of the most complete structures of its kind in existence. The facilities it gives for the thorough and practical teaching of the primary branches are said to be equal to those of the most advanced European medical schools. The other two universities in the province are of a denominational character, the University of Laval (1852) being governed by the Roman Catholic Church, and the University of Bishop's College in Lennoxville (1853) by the Protestant Episcopal Church. The earliest academical foundation in Nova Scotia was King's College and University at Windsor. It originated in a recommendation made by a committee of the House of Assembly in 1787, was founded by Act of Parliament in the following year, and received a royal charter from George III. in 1802. It is an institution of limited extent, and is connected with the Church of England. Dalhousie College and University at Halifax was founded in 1821, but did not come into operation until 1838. Even then it had a struggle for existence, and for some years was actually closed altogether. The college was reorganised in 1861, and received further legislation in 1875 and 1881. In 1868 a faculty of medicine was added, which ultimately developed into an affiliated college; and in 1883 a faculty of law was established. Between 1879 and 1884 several new professorships were endowed by the liberality of private persons, and the erection of new buildings was commenced in 1887.

In *South America* universities and kindred institutions are spreading rapidly. The Imperial College of Brazil at Rio de Janeiro has a staff of more than twenty professors. Its course of study extends over seven years, at the end of which the degree of Bachelor of Arts may be obtained. There are also in Brazil faculties of law and medicine, the latter of which confers degrees after a curriculum of six years. A number of Brazilians are usually in attendance at the University of Coimbra in Portugal, where not a few have gained considerable distinction. In the Argentine Republic superior education is given in two universities, comprising faculties of law, medicine, and engineering, and attended by a total of about 900 students. Universities and colleges were founded in Peru very soon after the Spanish Conquest. The central university of San Marcus at Lima is the most ancient in the New World. Its charter was granted by the Emperor Charles V. in 1551, who conceded to it all the privileges enjoyed by the University of Salamanca, and the existing buildings were commenced in 1571. It has faculties of theology, jurisprudence, medicine, political science, and applied sciences. The University of Chili has a staff of nearly forty professors, besides assistants, and is attended by about 700 students. It is a free university, and embraces the faculties of theology, law, medicine, humanity, and mathematics, in all of which it grants degrees. In the United States of Venezuela there are two universities, with nineteen federal colleges and over 2,500 students. In accordance with a recent decree of the President of the Republic the central university of Venezuela commenced the publication of a monthly *Revista Científica* in September 1887.

Indian Universities.—In India the Universities of Bombay, Calcutta, and Madras were founded in 1857, on the model of the University of London. These universities are therefore merely examining boards, all instruction qualifying for their degree examinations being carried on in colleges and other institutions recognised by or affiliated to them. The special function of the Indian universities, according to their charters of incorporation, is to ascertain by means of examinations the persons who have acquired proficiency in different branches of literature, science, and art, and to reward them by academical degrees. Originally, the granting of de-

grees was confined to the departments of arts, law, medicine, and civil engineering, but in 1860 an Act was passed enabling the universities to confer additional degrees in other departments of knowledge, and in 1884 the power of granting honorary degrees was also granted. The universities control the whole course of higher education in India by means of their examinations. The matriculation examination is open to all, but when that is passed candidates for higher stages must enrol themselves in one or other of the affiliated colleges. Many fall off at this stage, and few proceed to the higher degrees. Calcutta possesses the great majority of graduates in law and medicine, while Bombay is similarly distinguished in engineering. The number of native institutions recognised by the University of Bombay for the purposes of graduation examination is fifteen. The number recognised by Calcutta University is much larger, viz.: in arts, up to the B.A. standard, forty-nine; up to the first arts standard, twenty-six; in law, nineteen; in medicine, one; in engineering, two. Such recognition is only obtainable by institutions which have the means of educating up to the standard of the highest degree in the faculty in which recognition is desired. Reasonable assurance is also required that they are established on a more or less permanent basis. At Bombay, within the past few years, there has been a great increase in the number of candidates presenting themselves for examination. The course of study for the science degree has been revised and extended. The study of French has been introduced, and Indian palæography has been added as an optional subject for the degree of M.A. in languages. At the matriculation examination of 1886–87, 2,452 candidates presented themselves, of whom only 527 passed. The large percentage of failures is accounted for by the defective state of primary and secondary education in the provinces. By far the greater number of failures occurred in the case of candidates who had been privately educated. Of these only forty-two out of 1,066 were successful. These examinations are taken advantage of by candidates of various religions and nationalities. The lists regularly include Parsees, Brahmans, Hindoos, Mahomedans, Jews, native Christians, and Europeans. A fourth university has been founded at Lahore, for the Punjab. Its constitution is similar to that of the other three, but it includes the teaching element, and follows more Oriental lines. It dates from 1882, when its first convocation was held at Lahore, in the presence of the Viceroy. The institution rapidly gained in popularity, and even in its second session it may be said to have rivalled Calcutta University, so far as natives of the Punjab are concerned. A singularly unfortunate circumstance affecting the Indian universities is the difficulty of preventing frauds in connection with their examinations. This circumstance was the subject of a Government inquiry at Lahore in the spring of 1888, and the syndicate of Bombay University was about the same time urged to appoint a committee to investigate into the real cause of the failure of so many candidates at the university examinations.

Australian Universities.—New South Wales has the credit of having founded the first university, not merely in the Australian colonies, but in the southern hemisphere. The Act of Incorporation of the *University of Sydney* received the royal assent on December 9, 1851. It empowered the new university to confer, after examination, degrees in arts, law, and medicine, and endowed it with an annual income of 5,000*l.* The University Extension Act of 1884 increased its graduation powers to all branches of knowledge except theology. The same Act admitted women to all its privileges equally with men. There are nominally four faculties in the university, but there are as yet no professorships in the faculty of law. The object of the university is to supply the means of a liberal education to all orders and denominations without any distinction. The lectures of the professors are accordingly open to persons not members of the university, on payment of a moderate fee for each course, and undergraduates of other universities are received *ad eundem statum* under certain regulations. Provision was made as early as 1854 for the foundation of colleges within the university in connection with the various religious denominations, in which students of the university might enjoy the advantages of residence, instruction in the doctrine and discipline of their respective Churches, and tuition supplementary to the professorial lectures. Three such colleges have been established—one in connection with the

There are over nine hundred matriculated students in the five colleges receiving such Government assistance. Up to 1887 the number of graduates was 155, chiefly in arts.

The Imperial University of Japan at Tokio had its origin in the intellectual activity which followed the political revolution of 1868. The old system of education was then cast aside and a new system devised, which shortly afterwards became established by law. The history of the university, although brief, is somewhat complicated, the institution having passed through various phases before it was placed on its present basis. The faculties of law, mathematical and physical science, and literature, spring from a school which in 1869 received the name of the 'University of the South,' to distinguish it from another which was founded about the same time, and which afterwards came to be called the 'University of the East.' In 1877 these two universities were united, the latter becoming the medical faculty of the new university of Tokio. In 1881 the university received a new constitution, which provided for the appointment of a president, four deans of faculties, professors, assistant professors, teachers, and other officers. The faculties were also to some extent rearranged, and regulations regarding the curriculum of studies issued. In the following year the curriculum was enlarged, so as to include the study of the Japanese language and antiquities and other subjects; and in this year the custom of sending selected students to Europe to prosecute their studies was introduced. A new degree was instituted in 1883, and changes of different kinds were effected in succeeding years, ending with the reorganisation of the university and its erection into the Imperial University of Japan in 1886. The new university comprises five colleges or sections: (1) law, (2) medicine, (3) engineering, (4) literature, (5) science. Each of these is placed under a Japanese director, and the whole institution is under the control of the Minister of State for Education, and depends for its revenue on annual allowances from the treasury of the imperial Government. The constitution of the university embraces many of the best features of the European systems. Students before entering must have undergone a satisfactory preparatory training. In at least two of the faculties the study of English and German is compulsory, and the addition of French is recommended where practicable. The course of study in the medical faculty extends over four years; in the other faculties it is one year shorter. The university is well equipped with libraries, laboratories, and museums; and a marine zoological station was established at Misaki in December 1886. Its members have latterly displayed considerable literary activity, as well as capacity for scientific investigation. The official publications of the university include *Journals of the Science and Medical Colleges* and *Memoirs of the Literature College*. The number of students on the roll for the year 1887–88 was 697, of whom 25 were prosecuting original research in the University Hall.

Literature.—There is a distinct want of a comprehensive work giving a general account of universities and university systems throughout the world. Such information can only be gleaned from a great variety of sources, many of them more or less unsatisfactory and incomplete. Professor C. Meiners' *Geschichte der hohen Schulen*, 4 Bde., Göttingen, 1802–5, was never a satisfactory performance, and is now quite out of date. The first serious attempt to deal adequately with the early history of universities was that made by F. C. von Savigny in his *Geschichte des römischen Rechts*, Bd. 3, 2te Ausg., Heidelberg, 1834; but this, too, has been superseded by Father Heinrich Denifle's really epoch-making work, *Die Universitäten des Mittelalters bis* 1400, of which only the first volume has yet appeared (Berlin 1885). Alongside Denifle may be placed F. Paulsen's *Geschichte des gelehrten Unterrichts*, Leipzig, 1885, and the same author's articles on *Die Gründung, Organisation und Lebensordnungen der deutschen Universitäten des Mittelalters* in von Sybel's *Historische Zeitschrift*, Bd. 45, 1881. Among less important but suggestive works may be mentioned Von Döllinger's *Die Universitäten sonst und jetzt*, München, 1867; J. H. Newman's *Idea of a University defined and illustrated*, 3rd edition, London, 1873 (Pickering); Matthew Arnold's *Schools and Universities on the Continent*, London, 1868 (Macmillan); and Professor S. S. Laurie's *Lectures on the Rise and Early Constitution of Universities*, Lon-

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The universities undertake the educational organisation; the towns provide the funds and attend to the local management; the whole constituting a network of local branches, working independently in association with the universities as a common centre. The cost of each course of lectures to a locality varies from 50*l.* to 70*l.* The university fee for the lecturer and examination is 45*l.*, to which must be added the local expenses of printing, advertising, hiring rooms, &c. In a period of ten years up to 1887 eight hundred courses of lectures were delivered, with an aggregate attendance of eighty thousand students, of whom about thirty-eight thousand did home-work and over ten thousand presented themselves for examination. The session extends from the end of September to April, and contains two terms of three months each. No limit is placed on the subjects of the lecture-courses, but in practice they may be divided into three groups—(1) literature and history, (2) science, and (3) art. The method pursued in the movement is based upon the recognition in all that is done of two kinds of people to be dealt with: (1) popular lecture audiences, (2) in every audience a nucleus of students. Those are regarded as students who are willing to do some home-work, however little, between one lecture and another. The combination of these two kinds of people is found to be for the advantage of both. The presence of students raises the educational character of the lectures, and the association of students with a popular audience gives to the teaching an impressiveness that mere class teaching could never attain. For such audiences and students the movement provides courses of lectures accompanied by classes, weekly exercises, and examinations for certificates. The lectures are given weekly in connected courses, and in order to ensure a complete and thorough handling of the subject each course consists of not less than twelve lectures. In no case can single lectures be given, or series of lectures on disconnected subjects, the movement having no intention of competing with regular institutions for popular lecturing. The lecturers are for the most part young men who are willing to devote themselves to teaching as well as to lecturing, and the intention is that the lectures should be as interesting as other popular lectures, with the difference that they chiefly aim at the i of continuity. The substance of course of lectures is laid down in a syllabus, which is meant to avoid cessity of note-taking on the on and of forming a condensed text-l the course on the other. Refere other books, for fuller details, are whenever necessary. This syllabu tains, among other things, weekly oises in the subjects of the lectures a to students of all sorts, and inten be done by them in working at hor at their leisure. The working of exercises is entirely voluntary, an dents may even send in their a anonymously. The lecture usuall an hour, another hour being taken u class work, in which the lecturer, in formal way, seeks to elucidate and home the matter of his subject.

At the close of each course of le and classes a final written examina held (conducted, not by the lectur by an independent examiner select the university) upon the matter lectures as indicated in the syllabus. examination is also voluntary, but i open to those who have done the v class exercises to the satisfaction lecturer. In connection with each months' course certificates are gran the university to students who sat double test, viz. (1) the lecturer's on the weekly exercises, and (2) th cial examiner's report on the final e nation. Great importance is attacl this double basis upon which the c cates are awarded, as it entirely ob many of the disadvantages of the common system of examination-tests certificates granted are of two kinds and *Distinction*; but order of meri competition generally have no place working of the movement. The chie tures of the University Extension sc are thus the circuit, the lecture, the the syllabus, the examination, and th tificate.

An extended plan of study has laid down by the syndicate of Camb University, in the form of a combinati single courses, for which special unive privileges are offered. This extended c will occupy, as a rule, three years, and be accepted by the university in pla the first year of the regular unive course. Students who have followed

university extension course and obtained certificates for the different parts of it will receive the title of 'Students affiliated to the university,' and have the right at any subsequent time to proceed to the university and obtain its degrees after two years' residence in place of three. But the purpose of this institution of affiliated students goes further than this. It is intended to encourage continuity of study, and to give the arrangement of a properly organised plan of work; and in fulfilling their functions as national institutions the universities believe that it is eminently desirable that, in addition to those who can become full members of them by residence, they should have a large body of students all over the country attached to them as associates, with every encouragement given them to become full members. The principle on which this course for affiliated students is arranged is as follows: (1) The greater part of it belongs to the special department of study to which the student's inclinations lead him; (2) as in the full university course, it is recognised that special studies require to be supplemented with a certain amount of introduction to more general studies; (3) this combination of special and general constitutes the scheme of study, but before admitting to the position of an affiliated student it is necessary for the university to take some guarantee that the student has received that minimum of elementary education which all the universities agree in requiring before they admit persons into formal connection with them. Accordingly, the course for affiliated students falls into three parts: (1) the special series of courses, (2) the general series of courses, and (3) the elementary examination, which embraces Latin and one other foreign language, the first three books of Euclid, and algebra to quadratic equations.

The extension movement has reached all classes of society without distinction. Audiences as miscellaneous as those of the congregation of a church or chapel have been repeatedly secured—an important feature of the scheme being that it is entirely free from religious or political bias. In some towns the lectures have been so successful as to lead to the foundation of permanent educational institutions. The University College at Nottingham is a conspicuous instance of this—the original endowment of 10,000*l.* having been given on condition that the Town Council would erect buildings for the accommodation of the university extension lectures, and to the satisfaction of the University of Cambridge. Similar results have followed in Liverpool, Sheffield, Leeds and other places.

Although the University Extension scheme has been chiefly identified with Cambridge, the other universities have by no means stood aloof from it. Durham University has actively co-operated with Cambridge in the north of England, where the movement has been remarkably successful; and the University of Oxford has since May 1885 taken its share of the work. Within two years its weekly courses of lectures and classes had been conducted in twenty-two towns and attended by more than 6,000 students, of whom the greater part were working men. The delegates of the University have also established travelling libraries containing the chief text-books and authorities recommended by the lecturers. These libraries have proved to be of the greatest value to students in towns where access to suitable books for study and reference is difficult. In London the movement is associated with the Universities of Oxford, Cambridge, and London, and is carried on with much energy by the London Society for the Extension of University Teaching, which was instituted for the purpose in 1876.

The work of the movement has also extended to Wales, where it is now carried on independently by the three University Colleges at Bangor, Aberystwith, and Cardiff. Each of these colleges arranges for Extension lectures in its own district, and, especially in North and South Wales, they have been taken advantage of by an encouraging number of regular students.

The University Extension movement has been somewhat slow in taking root in Scotland. This may to some extent be accounted for by the general accessibility of the Scottish universities themselves, for there is much truth in the remark once made by Lord Reay, that the principles of the Church of Scotland and of John Knox had made such a movement in Scotland superfluous. Notwithstanding this, the scheme has been agitated, and experiments have even been tried. Perhaps the most favourable of these was in the case of the University of St.

Andrews, which, as early as the winter of 1875–76, conducted five courses of lectures in the neighbouring town of Dundee. In point of attendance these lectures were a decided success, and those who underwent the prescribed examinations acquitted themselves in the main with considerable credit. But the enthusiasm which met them at the outset was not maintained, and in the second and third series the attendance fell off by about one-half. The lectures were accordingly discontinued, and are now rendered unnecessary by the subsequent foundation of a University College in Dundee. In the winter of 1886–87 a provisional committee was formed in Edinburgh for the purpose of elaborating and, if possible, carrying out a scheme of Scottish university extension. The subject was also brought under the notice of the senates of the four Universities, and several of the larger towns were visited by the promoters of the scheme, with a view to securing their co-operation. A circular was drawn up and distributed, together with syllabuses of some of the proposed courses of lectures, the result being highly encouraging. At Perth, Montrose, Dunfermline, and Dumfries, societies were immediately established that those towns might avail themselves of the advantages offered by the movement. A course of lectures on botany was delivered to about seventy students at Dunfermline in the summer of 1887, and was followed by a more largely attended course in the autumn. At Dumfries a course on geology was equally well attended; while at Perth, the ambitious scheme of two courses before and two after Christmas was tried with a success that exceeded anticipation. The courses on English literature, physical geography, political economy, and Greek literature were attended by over 600 students in all. In each case the evening lectures had to be repeated next day. The tutorial classes following the lectures were in all cases successful, and much work was done in the form of exercises and essays; while the final examination conducted by external examiners showed that a high standard had been attained. From Perth the movement spread to neighbouring towns, in which the course in English literature was repeated to audiences even larger, in proportion to the population, than in Perth itself. These towns, by forming a joint local committee, secured the advantages of the scheme at a very moderate expense. The University of Glasgow has established a University Extension Board consisting of seventy-three persons, with an executive committee of sixteen, to take charge of the western district of Scotland. This is more especially the outcome of the Queen Margaret Guild, in connection with the Queen Margaret College for women in Glasgow, by which in 1886 courses of instruction were organised in Ayr, Helensburgh, Paisley, Hamilton, Kilmarnock, and Lenzie. The general council of the University of Glasgow made a representation to the university court in favour of the movement, and the senate, with the approval of the court, definitely organised its extension scheme. The University of St. Andrews formed a similar Board in March 1888, consisting of eighty persons, for the promotion of the movement, more especially in the counties of Fife, Forfar, and Perth; and about the same time the University of Edinburgh prepared an Extension programme. Lecturers licensed by any one of these universities are eligible as lecturers in connection with any of the others. The provisional extension committee of 1886 is now superseded by these formal university boards. See *The University Extension Movement*, by R. G. Moulton, M.A., London, 1886; *The Health Exhibition Literature*, vol. 16, London, 1884 (papers by Albert Grey, M.P., and E. T. Cook, with discussion); and the official publications of the various University Extension Boards.

University Reform.—All that can here be attempted is an account of the reforms that have been carried within this generation, and a suggestion of those reforms which are called for in the immediate future. The legislation of 1854 forms the natural starting point. The agitation for this reform was set on foot by Mr. Heywood, a Unitarian educated at Cambridge, who, in 1850, moved 'a humble address for a commission of inquiry into the state of the universities of Oxford, Cambridge, and Dublin, with a view to assist in the adaptation of these important institutions to the requirements of modern times.' A royal commission was granted by Lord John Russell's Government, which reported in 1852. In accordance with this report a Bill was introduced in 1854, which in

modifications in committee, passed both Houses. The Universities Reform Act of 1854 (17 & 18 Vict., cap. 81) and the College Ordinances framed under its provisions effected wide and sweeping reforms both in the constitution of the universities and their curriculum. For the Hebdomadal Board, consisting of heads of houses and the proctors, it substituted an elective council (with only four *ex-officio* members). The old Congregation, which had as little real power as the Homeric Agora, was replaced by a deliberative assembly embracing all resident members of Convocation. Fellowships generally were thrown open

of the colleges were in some measure safeguarded by a provision that each college, while its affairs were being discussed, should be represented on the commission by assessors elected *ad hoc*. The commissions sat for several years, and their proceedings resulted in the transference, in round figures, of some 25,000*l*. a year from the colleges of each university to the university, the assessment being determined in each case by the wealth of each college as compared with its numbers. A respite also was allowed before enacting the full subsidy fixed by the commissioners. The income thus accruing to the university

the last point mentioned in the discussion of impending reforms. Students of Newnham and Girton College were first allowed by the courtesy of individual examiners to take the papers in certain Tripos examinations; then these informal examinations were recognised first by Cambridge, and afterwards, with certain restrictions, by Oxford; but the Cambridge Senate in 1888 refused even to entertain a motion pressing this permission to its logical conclusion, and granting to women who had passed the required examinations the university degree. The main argument adduced by the opponents of this reform is most instructive. If, it was said, we admit women to honours degrees we must also admit them to pass degrees. But examinations for a pass represent such a narrow circle of studies and such a low intellectual standard that to admit women to these examinations would invite a class of idle women undergraduates, and would react injuriously on the curriculum of the high schools. Such an admission shows how far Oxford and Cambridge are still from being pure seats of learning. An Oxford professor has characterised responsions and pass moderations as 'examinations which it is an indignity to require a man to undergo who has arrived at years of discretion.' According to Prof. Sayer they represent 'the power of perpetrating a piece of Latin prose, which would have made even a provincial stone-cutter of the fourth century sick to read, of reproducing in a mangled shape the impossible English of some third-rate crib, without the faintest understanding of the thought or language of the original, and of setting down Greek forms which have no existence save in the pages of obsolete and unscientific grammars.' Yet no reformer has yet had the courage to propose a raising of the standard, because a severer test would scare away young men of rank and wealth whose presence lends to Oxford and Cambridge their peculiar social charm. Yet Oxford and Cambridge have survived the extinction of the fellow-commoner, and we cannot doubt that they will proceed on the path of reform by enforcing more strictly the Winchester motto, *Aut disce aut discede.*

Another cognate reform that has often been mooted presents a more difficult problem. That scholarships founded for the maintenance of indigent scholars should be held, as they too commonly are, by the sons of well-to-do or even wealthy men is an obvious abuse, yet it is not easy to suggest a remedy. To modern notions an enforced test of poverty would appear invidious and inquisitorial, and past experience shows that such tests are sure to be evaded. We must rather look to the growing influence of public opinion which will make it seem as disgraceful for a rich man to accept a scholarship for his son as it is for himself to accept a Civil Service pension. At the same time, though much has been done, particularly in the case of Keble College, to diminish the cost of a university education, it is clear that it is still artificially enhanced.

Another and a more pressing question remains—the relation of the university and the colleges. The last commission sought to strengthen the central authority and to increase its teaching power. This augmentation of the university was necessarily made at the expense of the colleges, and the colleges have, in consequence, been straitened in their means, and their efficiency has, to a certain extent, been impaired. Whether this loss has as yet been compensated by the extension of the professoriate is doubtful. On this point some statistics gathered from a parliamentary return, granted on the motion of Mr. Thorold Rogers, 1886, are instructive. At that date there were at Oxford and Cambridge 617 fellows[1]; of these 245 were employed in college work, and 79 were employed in university work. The attendance at the lectures of university professors varies from a maximum of 122 at Oxford (the Regius Professor of Divinity's lectures) and of 140 at Cambridge (the Professor of Anatomy's) to *nil* in either case. At Oxford the Camden Professor of Ancient History reports that in 1885 he offered a course of lectures, but no students sending in their names, he has not since attempted to lecture. At Cambridge the Professor of International Law had not lectured since 1880, when he was deterred from lecturing by his ministerial duties, and allowed to appoint a substitute. The Professor of Latin offered classes in three consecutive terms, but no classes could be formed. The defence advanced for these classless professors and the plea which some of them put forward is that they are

[1] This is exclusive of fellowships at All Souls' College, most of which are honorary.

engaged in the work of research. But in this plea there seems to lurk a fallacy. The examples of Faraday, of Huxley and Tyndall, and a crowd of German professors, show that original investigation is stimulated rather than impeded by being pursued in conjunction with educational duties, provided these duties are not too onerous. 'Experience has shown that in any university where education is duly cared for research will take care of itself.'[1] The present is a state of transition; the university has ceased to be an aggregate of colleges, but it has not yet assumed its proper function, to supply the highest teaching in every branch of knowledge, and at the same time to co-ordinate the tutorial teaching of the colleges. It has not yet perceived that something more than learning is required in a professor, that he must be able to attract students and to kindle enthusiasm. It would be well if his salary were made in part dependent on fees, and if the professorship were held only for a stated period and subject to re-election.

A larger question remains which we can only glance at. To many it seems that the older universities have already reached a point at which accession of numbers is no longer an accession of strength, and that the best hope for the future of higher education in England lies in the foundation of new institutions in the chief centres of industry and commerce on the lines of the Victoria University. A Royal Commission was appointed in 1888 to consider the requirements of London. The University of London, as has been often pointed out, is a misnomer. It is nothing but an Imperial Board of Examinations. Its degrees and diplomas have a high commercial value, and justly so, but the only genuine work of a university, the pursuit of knowledge and the training of faculty, is not even attempted. A university, to borrow the words of Burke, is 'a partnership in all science, in all art, in every virtue, in all perfection.'

University Robes.—Academical life, and indeed educational life generally, has in all ages and amongst peoples of every kind and variety of confession sustained a close relation, whether in the way of parallelism or of reciprocal action, with the life of the cloister and the temple. The school has commonly been the expansion and the perpetuation of the shrine; the college has frequently been the appanage and the survival of the convent. Thus it happens that the rise and progress of public schools and colleges, with the peculiar nomenclature inherited, developed, or affected by them, as well as the distinguishing habits which they adopted, are to be so largely traced in the history of monasteries or other ecclesiastical foundations. The *scholars*—for *fellows*, notwithstanding that the expression is met with in Chaucer, is a name of comparatively later date—were monks and clerks, *clerici*; the abbot was the *custos*, *rector*, *warden*, or *magister* of the different orders; bishops and abbots were *graduates*, and were so denominated, and distinguished by their dresses; and the different habits are but habits of the old religious orders, somewhat improved. The monastery itself was called *collegium*; and its language, its rules, and discipline all passed, by an easy transition, into the college forms still existing in the more ancient of our universities.

Mr. Edmund Carter, a somewhat enthusiastic historian of the University of Cambridge, forbears the endeavour 'to ascertain the original appointment of the several sorts of dress which have from time to time been appropriated to each degree' conferred by the university. 'I am of opinion,' he says, 'that *Academical*, or graduate habits of *Universities*, are much more ancient than those used by monastic orders; yet, at the same time, it must be allowed that the present set of *Academical* habits are much altered from those worn by the *Greeks*, *Romans*, or ancient *Jews*, or by the *Magi* in *Persia*, or by the Druids in our own nation. Nor was it possible for them almost to escape the general alteration which was made by the long dominion of the *Monks*, *Friars*, and *Canon-Regulars*, over the minds, persons, and constitutions of this land. Thus it is we see an undergraduate in a gown of a novice of the *Friars-Preachers*; the *Masters of Arts* in the habit of a *Canon-Regular* of *St. Augustine*, a *Doctor of Divinity* nearly approaching to the dress of a *Benedictine Monk*. The cap is exactly borrowed from the said *Canons*; and the colour of all those habits that are not black, and the shape of the hoods belonging to the several degrees, are only small variations from the dress;

[1] Paper by G. W. Hemming, Q.C., International Conference on Education Proceedings vol. iii. p. 334.

thing we are very happy, we use these distinctions as the most pure ages have set us an example, for the well ordering the body politic, and not superstitiously to persuade the people they contain any merit in themselves, or convey any virtue or grace. Some badges of honour and ornament of learning have always been allowed of, amongst the most conscientious: and as the present habits of our graduates serve only to convey an immediate idea of their standing in the *University* upon sight, they are not to be considered evil in themselves, nor as conveying any of those superstitions which the *Reformation* has banished from our *Universities*.'

A more particular reference—seeing that it is conversant about one religious fraternity only—of academical or university robes to the distinguishing habits of monastic orders, is made by Anthony à Wood, the annalist and historian of Oxford, a scholar with whom the honour of his *Alma Mater* was a ruling passion, strong in his life, strongest of all in his death. 'The next distinction for scholars, besides degrees, are habits and formalities, which have been used in this university,' says Wood, 'from the days of King Alfred (if not before) to these times. For when literature was restored by certain Benedictine monks whom that king appointed to read in Oxford, the scholars did from that time, as we may suppose, take their fashions, that is to say, Ocreæ, aut Vestes, vel Habitus de pulla chimera, i.e. boots, and garments, or habits of a black colour or resemblance. As for other formalities, which they did wear, as cap and hood, I am not certain whether the scholars followed the fashions of them or not, but as far as I can yet understand they did. Joh. Wolfius, in speaking of the order and habit of the Benedictine monks, saith thus: "In vestitu veteres usi fuerunt cuculla, tunica, et scapulari: cuculla est cappa supra tunicam inferiorem quam Meloten quidam appellant: a nonnullis Tax dicitur: scapulare etiam a scapulis, quod scapulas tegit, &c." Which hood, coat, and scapular (the last being a narrow piece of cloth hanging

of the Benedictines, an order to whose members literature owes the gratitude due to splendour of service, was anciently used by the generality of scholars; being at first, according to trusted authorities, no more than an ordinary coat, *tunica*, and reaching only a little lower than the knees. The shoulders were but slightly gathered, if they were gathered at all; and the sleeves, which afterwards gradually came to be much enlarged, were originally not much wider than an ordinary coat. The form of the gown suggested the fashion of the surplice, or *dalmatica*—so called from the circumstance that it was first produced in Dalmatia, where it was originally worn as a royal robe—which was in the beginning very scanty and slender, but afterwards wider than the gowns. When degrees came to be more frequent, as they did towards the close of the twelfth century, certain modifications of the gown were introduced for the sake of distinction, not only in relation to the degrees themselves, but also to the various faculties in which they were taken; the wide sleeves still being worn withal by bachelors, and by undergraduate holders of scholarships—'worn at first black, then in several colours, and at length, when Dr. Laud was chancellor, black again by every scholar, unless the sons of noblemen, who may wear any colour. To conclude,' Wood proceeds, 'though there was a common distinction in vestitu made between the masters or doctors of theology, medicine, law, and arts, yet in solemn assemblies and perambulations or processions of the university, the fashions of their vestitus were all the same, only differenced by colour; as for example, the fashion that masters or doctors or professors of theology used, was a scarlet gown with wide sleeves (not of a light red as now, but red with blue or purple mixt with it) faced with certain beast skins furred both costly and precious. Over that was a habit of the same, viz. half a gown without sleeves, close before, and over all a hood lined with the same matter that the gown is faced with. The fashion of a doctor or professor of law or medicine was the same with the-

furs or minever. As for bachelaurs of arts, law, and physic, their gowns, which were of various colours, as russet, violet, tawny, blue, &c., were also wide-sleeved, but not faced, and their hoods (for they had no habits) of the same colour with their gowns, but not lined, only edged with lamb or cony skin. The gown that a doctor of divinity now wears, as also that by a master of arts, or such that are in holy orders, hath no cape, only long sleeves with a cross slit to put the arms through. Which gown is not ancient, and never known to be worn by any before the time of John Calvin, who, as 'tis said, was the first that wore it, but had the slit longways, and facing lined with fur.'

With reference to the cap, pileum, or cappa, Wood remarks that the wise men of the ancient world and the priests were wont constantly to appear with the head covered, velato capite, i.e. pileato; and that this custom was demanded of them severally by considerations of dignity and religion. 'The fashion being taken up by the philosophers at Athens did give occasion to the Parisians and afterwards to Oxonians to use them, they being imitators of their customs. Of what form we at the first used them, whether close, stepled, plaited, square or round, I know not. 'Tis probable we did in process of time imitate the Benedictines, as in other matters we did; but then again, whether they in most ancient time did use the same fashioned cap as now, it may be a question, because by the acts of several councils and chapters among them, alterations have been made. The square form, with the upper part something stepled, is ancient, as hath been proved by pictures in ancient glass windows; but when the laws and school divinity entered the university, the doctors of those faculties and of medicine wore round caps; the first and the last wear them still; but some years before the Reformation of the Church of England, the theologists wore square, without any stifning in them (which caused each corner to flag), such as judges and justices itinerant now use' (Wood's *History and Antiquities of Oxford*). It is probable that the use of round caps was confined to doctors or masters in divinity, who in the reign of Henry VII. and on as divines,' to revert to the ipsissima verba of Wood, 'preached in caps (as they did in square afterwards, used by the Catholick party in England, till Queen Mary died, and religion altered) so the auditors, if scholars, sate in them, which continued so till the late unhappy times; but when K. Ch. II. was restored, then the auditors sate bare, lest if covered, should encourage the laical party to put on their hats, as they did all the time of rebellion. Some before the Reformation would preach in cappis clausis, but that they could not do without a dispensation.' In a note upon the foregoing extract from Anthony à Wood, it is stated that 'divines preached in square caps in the reign of Q. Mary, as may be seen in the burning of Ridley, Latimer, and Cranmer, recited by Mr. Fox. Dr. Smith preached at the burning of Ridley and Latimer; Dr. Hen. Cole at Cranmer's recantation.' And Walcott remarks that 'until the Restoration, the preacher and academical congregation wore their caps in sermon time at the universities.'

Du Cange thinks that the square cap of the university was formerly that part of the amice—or furred hood, having long ends which hung down the front of the dress, something like a stole, and which was worn by the clergy for warmth when officiating in the church during inclement weather—which covered the head, and afterwards became separated from it, that is from the amice. Mr. Fairholt, flavouring his remarks with a soupçon of raillery, says that 'the square caps, still worn at our universities, originated about the time of the Reformation, and were generally worn by grave and studious men.' It has undergone some modification from its original form; and, 'in its descent to our own days, the warm overlapping sides are discarded, and a plain, close skull-cap takes the place—the broad pointed top being imitated by a hard, square, flat piece of pasteboard and cloth, destitute of meaning and utility: preserving the form of antiquity, deprived of its spirit.'

With regard to the hood, of which there have been several kinds, it is to be observed that the most ancient variety was that which was sewn or tied to the upper part of the coat or gown, and brought over the head for a covering, like a cowl.

The severe and simple basis upon which is reared the elaborate fabric of academic apparel, in all its wideness of range and its manifold variety, is the black gown of silk or stuff; an austere and sombre robe which, whilst it forms the principal part of the ordinary dress of every rank of the hierarchy of the several faculties about which the most ancient and the most comprehensive of our universities are maternally concerned, refers back the original habits of these to the ancestral habits of the monastic orders, and especially of the learned fraternity who followed the rule of St. Benedict.

'In the fifteenth century,' to adopt a few sentences of pertinent epitome from the article 'Costume' in the *Encyclopædia Britannica*, 'when distinctions appear first to have been introduced into the costumes of masters and bachelors of arts, the gowns of the latter were shorter than those of masters, and had full sleeves reaching to the wrists and pointed at the back. The capes and hoods of bachelors also were bordered with white fur or wool. By various peculiarities of form, colour, and lining, the gowns, capes, and hoods of graduates of all the higher ranks certainly were distinguished; but in the comparatively rare examples of monumental effigies represented in academic habit, which almost without exception are destitute of colour, these distinctions are not shown in any regular or marked and decided manner. Throughout the last 200 years, if not for a still longer period, the academic habits of the University of Oxford have retained their forms unaltered. They may generally be classified in two groups—ecclesiastical and civil. The gowns of the former, worn by all graduates in both divinity and arts, and also by all members on the foundation of any college, have loose sleeves, are destitute of collars, and gathered in in small plaits at the back, and bear a general resemblance to what is known of the more ancient habits, the sleeves of the masters' gowns still having slits (now cut horizontally, instead of vertically) for the passage of the arms. On the other hand, the gowns of graduates in law and the other faculties, and of undergraduates who are not on the foundation of any college, have falling collars and closer sleeves, which latter in the undergraduates' gowns have dwindled into mere strips. The gowns of graduates of the University of Cambridge for the most part are the same as those worn in the sister university; but at Cambridge the undergraduates, not being on the foundation, of almost every college have a gown appropriated to their own college.'

The black gown, to make a definite statement for which the way has been already prepared, is, academically speaking, a universal standard of reference, a standard by which to judge identities, departures, approximations, divergences. For the gown is the article of dress, *par excellence*, in which the tendency is exhibited on the part of the relatively junior universities of the British Empire all the world over, and even of those in their infancy, to select, adjust, or regulate their robes by the robes so long in vogue in the more venerable institutions of Oxford and Cambridge. With this tendency, and independently of this tendency, there is a concurrent disposition, as amongst the Scottish universities, to affect the vestiarian traditions of the University of France, or other of the more ancient of the Continental universities, several points of whose economy and administration — notably their divisions and their divisional voting by nations, as at Glasgow and Aberdeen on occasions when the body of the students become an electorate for such academical and non-political purposes as the choosing of a Lord Rector (*see* RECTOR)— they have for the most part assimilated.

After all the numerous changes, however, in the form, material, colour, or detail of ornament, of the gown as an academic robe, it remains that the hood is the most salient and distinguishing of all the articles recognised in collegiate costume.

By the fifty-eighth Canon, 1604, of the Church of England, it is enacted that 'such ministers as are graduates shall wear upon their surplices such hoods as, by the orders of the universities, are agreeable to their degrees, which no minister shall wear (being no graduate) under pain of suspension. Notwithstanding, it shall be lawful for such ministers as are not graduates to wear upon their surplices, instead of hoods, some decent tippet of black, so it be not silk.' Much has been said, at various times, both for and against the hoods or tippets of the theological colleges in England. On the one hand it has been argued that the

Canon just quoted permits only graduates to wear any kind of a hood over their surplices, and restricts all non-graduates alike to a plain stuff black tippet. It is replied, on the other hand, that the Canon was framed before theological colleges were contemplated, and that it cannot apply, therefore, to these recognised institutions for training candidates for holy orders. Besides, it has been said that a distinguishing mark, even a coloured lining to the 'decent tippet of black,' is no infringement of the Canon. On these grounds some of the theological colleges have for years adopted a coloured lining or edging to their hoods, in more than one case with the express permission of the Archbishop of Canterbury at the time it was introduced. In allusion to this practice Lord Grimthorpe, with an outspokenness which is at least fully flavoured by his characteristic jealousy for academical and ecclesiastical *convenances*, says that 'sundry theological colleges have taken upon themselves, with some pretended licences from archbishops, to authorise their students to wear hoods of their own invention. But they are entirely illegal "ornaments" in church, so far as they differ from "a black tippet not of silk," which alone is lawful for non-graduates, according to Canon 58' (article *Hood*, in Hook's *Church Dictionary*, 14th edit. 1887).

In accordance, we assume, with the direction of the Canon, however, it has been authoritatively recommended—as by the Upper House of Convocation of the province of Canterbury, in February, 1882—that all the theological colleges of the Church of England should have a uniform hood for their non-graduate members, to be in substance the same for all, and to be, according to the Canon, 'black, but not of silk;' each college, however, being at liberty to add to the hood a coloured edging, border, or binding, by which its own students might be distinguished. Some of the theological colleges promptly adopted the plan prescribed in the Resolution of Convocation; but a difficulty in the way of its universal acceptance arose from the unwillingness of such institutions as had formerly adopted or possessed a lining for their hoods to relinquish this distinction for a narrow border. Nevertheless, at a Conference of the Principals and Tutors of Theological Colleges held at Oxford in the month of April following, the Resolution was received and confirmed; so that it may be taken as embodying a duly authorised custom, and, practically, the law on this subject.

Finally, it is to be recorded that the Archbishop of Canterbury has the faculty, one of the few relics of his ancient power, as official Legate of the Pope, of conferring degrees in arts, divinity, law, medicine, and music, upon persons of approved and competent merit; and the holders of these distinctions, which are known as Lambeth Degrees, wear the gowns and hoods of the university of the Archbishop conferring them.

University Scholarships.—In the strict sense of the term these are scholarships (prizes in money paid for one or more years) open to all members of the universities, including scholars of colleges who have not exceeded a certain number of terms. Thus the Hertford Scholarship at Oxford, and the Bell University Scholarship at Cambridge, are 'blue ribbons.' Particulars will be found in the University Calendars. Special subjects, which change annually, are periodically announced in the *Oxford University Gazette* and the *Cambridge Reporter*. Information is given by the registrars or the proctors. A scholarship at a university is generally understood to mean an entrance scholarship at one of the colleges. Men may of course obtain scholarships after they have matriculated as commoners, but few do. School scholarships, or exhibitions, do not entitle the holder to wear a scholar's gown. Each college has its own time and system for election to scholarships; but it is now very usual for several to combine in one examination. In this case the candidate has to state his order of preference. The dates and subjects do not vary much. The limit of age is generally nineteen; but some scholarships are quite open. There are usually no restrictions as to creed or colour. Scholarships are rarely worth more than 80*l.* for four years. All 100*l.* scholarships, except those at Hertford College, and a few special ones, were cut down at Oxford by the last Commission. It is usual to re-elect after the first two years. At Cambridge scholars are oftener elected with a lower sum than 80*l.*, but this is increased after subsequent examinations There are a few worth

100*l.* for seven years at Cambridge. Most scholarships there are for mathematics and natural science; but this preponderance is not so marked as that for classics at Oxford. There are about five hundred scholars in residence at one time at Oxford. About one hundred and twenty are elected annually, and about the odd twenty are elected for proficiency in science, mathematics, or modern history. Some only of the colleges give science scholarships. A few depend upon the local or joint-board examinations. A scholar is generally expected to begin residence in the Michaelmas term. Some men have been able to live on their scholarships, but this is not usually the case. Others have been known to live on 60*l.* a year as non-collegiate students. The controversy as to what a man *may* live on is obviously a complex one. In a college, it is certainly nearer 120*l.* than 80*l.* Boys who think of going to the universities should consult their masters in good time. Parents who wish their sons to take up non-classical subjects should satisfy themselves that the school has a really good 'modern side,' or much time will be wasted. In selecting a school they should ascertain whether the school has any scholarships attached (*see* Cassell's *Educational Year-Book*). The general particulars about scholarships will be found in the calendars of the respective universities, e.g. Dublin, Edinburgh, Glasgow, Aberdeen, St. Andrews, London, Victoria University, &c. For Oxford or Cambridge it is best to consult *The Student's Guide* (Cambridge: G. Bell & Co., London, 2*s.* 6*d.*), or *The Student's Handbook* (Oxford: Clarendon Press; London: Froude, Amen Corner, E.C., 2*s.* 6*d.*). They contain outlines of all the university courses. New editions appear at intervals. The Entrance Scholarship papers at Cambridge are annually published with others in Palmer's *Cambridge University General Almanack and Register* (London: 32 Little Queen St., E.C., 3*s.* 6*d.* net). The best general account is in Dr. Pott's *Cambridge Scholarships and Examinations* (Longmans, 1883). This explains the ways of the different colleges. There are no exactly similar books at Oxford. Information and specimen papers are given by the senior tutors of the different colleges. The conditions of examination are advertised months beforehand in the *Oxford University Gazette*. There is a handy manual on *Classical Scholarships*, published by J. Thornton, Oxford, price 3*s.* 6*d.* A series of 'guides' to the different schools in the university is also appearing. Candidates on coming up are usually assigned rooms in college by courtesy; but sometimes they have to find lodgings. (*See* SCHOLARSHIPS and BURSARIES.)

University Scholarships for Women are awarded partly on the results of the higher examinations, and partly by examinations at Cambridge and Oxford. A good general idea of conditions and possibilities is given in chapters x. to xii. of Pascoe's *Schools for Girls, and Colleges for Women* (Hardwicke & Bogue, 1879, 3*s.* 6*d.*). Those likely to go to Cambridge should write to the mistress or secretary of Girton College, or the lady principal of Newnham College. At Oxford, to the lady principals of Lady Margaret Hall, Somerville Hall, or St. Hugh's Hall. The average value of scholarships at Lady Margaret Hall is 35*l.* yearly for three years; the Hall fees are 75*l.* yearly, with from 15*l.* for lecture fees. At St. Hugh's, from 45*l.*, exclusive of lecture fees. (*See* SCHOLARSHIPS.) There are also scholarships and degrees for women at London University. Residence in a college is not always necessary; the chief ones in London are Queen's College, 43 Harley Street, W.; Bedford College, 8 York Place, Baker Street, W.; North London College, Sandall Road, Camden Road, N.W. There are other ladies' colleges, as the Crystal Palace, Twickenham (St. Margaret's Royal Naval Female School), Cheltenham (Miss Beale), Exeter (Miss Hall), Hastings (Miss Eaton), Jersey (Miss Roberts), Guernsey (Miss Gilbert), and the new palatial Royal Holloway College (for those over eighteen), Egham, Surrey (Miss Bishop). The various high schools, the Girls' Public Day Schools (Office: 21 Queen Anne's Gate, London, S.W.), Church Schools Company (Office: 2 Dean's Yard, Westminster, S.W.), usually afford the best preliminary training for university scholarships for women. They subsequently utilise the invaluable provincial colleges (*q.v.*) at Birmingham, Bristol, Leeds, Liverpool, Manchester (Owens College, Women's Department, 223 Brunswick Street), Nottingham, Sheffield, Aberystwith, Bangor, Cardiff, Dundee, &c. Medical scholarships for women are also available. The S.P.C.K. (Northumberland Avenue, London, W.C.) offers scholarships

of 75*l.* or less for four years under certain conditions of going abroad. Scholarships are sometimes provided under the auspices of local associations, about which the girl-student should make inquiry. In most cases the secretary of the Teachers' Guild (14 Buckingham Street, Strand, W.C.) would be able to give addresses of local correspondents and other information. The local secretaries of the Higher Examinations and the University Extension (*q.v.*) Lectures should also, if necessary, be addressed.

Usher.—This word means literally 'a doorkeeper,' or one who introduces strangers. Even as late as the middle of the seventeenth century it was not an uncommon thing for a head-master of a school, especially in a country district, to have no assistant. When he was allowed or could afford one, this assistant teacher was called an *usher*. Later the term was only applied to the junior assistant in a school, and later still to the poorly-paid assistants of *private* schools. The term, which had thus acquired a contemptuous meaning, has now almost entirely disappeared from use in English schools. It still, however, in the older sense, lingers on in courts of law.

Utilitarianism.—The influence of the principles known severally as Utilitarianism and Rationalism upon systems and methods of education is so nearly identical, that these names for two streams of tendency may be taken for the purpose of this article as very nearly convertible. It will add to ease and lightness of movement, therefore, and to economy of expression, if in the following remarks the more particular Utilitarianism is generally assumed to be included in the more comprehensive Rationalism, and is scarcely ever found to demand a separate and nominal mention. A formal definition of Utilitarianism may on this account be dispensed with; whilst of Rationalism it may be said that it is a spirit, tendency, principle, or system, which characteristically refers every subject of investigation to the reason, *ratio*, as the canon or criterion of judgment and authority. In religion, it is a certain cast or bias of thought, rather than any class of definite doctrines or criticisms, which claims for the unaided human reason the right of deciding matters of faith, and which leads men on all occasions to elevate the dictates of reason and conscience over dogmatic theology, and, as a necessary consequence, greatly to restrict the influence of the latter on life and conduct. It predisposes men, in history, to attribute all kinds of phenomena to natural rather than to miraculous causes; in theology, to esteem succeeding systems as the expressions of the wants and aspirations of that religious sentiment which is planted in all men; and in ethics, to regard as duties only those of which conscience declares the obligation. It is an expression of that decline of the sense of the miraculous which is assumed to be one of the fruits of civilisation; and its spirit has shown itself in an analogous movement of secularisation which has passed through every department of political and social life.

Such a word as Rationalism could scarcely have escaped the misfortune of so many others which not unreadily lend themselves to abuse and equivocation. As it is incidental to humanity that all persons should profess and believe themselves to be rational, and should deprecate the holding of any views about religion but such as are founded on good reasons, it has followed that the terms rationalism and rationalist are frequently mere conventional epithets.

The word Rationalism has been used, especially in Germany, in various senses; and Bretschneider, for instance, whom Professor Hahn praises as having set on foot the best inquiry on this point, says that the word Rationalism has been confused with the word Naturalism, since the appearance of the Kantian philosophy, and that it was introduced into theology by Reinhard and Gabler. In fact, Rationalism is at once the antithesis of the Naturalism, or simple Deism, which arose in the sixteenth century and was spent in the seventeenth, and with which it is sometimes confounded, and of Supernaturalism, which is the formal and literal exclusion of Naturalism.

The spirit of Rationalism is a projection and continuation of the spirit of the Reformation, and a variety, indeed, of its expression—that of a revolt against authority, with its assertion of the right and the peril of private judgment and of individual responsibility. It was the province of the Reformation to resist the insolence of the Church in its imposition of fetters upon religious opinion; and

when, with the abandonment of the traditional method, it became necessary to ascertain another basis of belief, it was in no bad faith that the early German Rationalists declared that the evidence for Christianity was found in its harmonising with the instincts and the needs of the soul. In the Protestant system the supremacy and the appeal were transferred from the Church to the Bible; against the authority of which the spirit of Rationalism, once docile, tractable, and amenable, came in time to rebel, as authority based on claims to inspiration which were not unimpeachable, and which might be attacked more unerringly than they could be defended.

A survey of the course of English theology during the eighteenth century would readily reveal the circumstance that throughout all discussions, underneath all controversies, and common to all parties, lies the assumption of the supremacy of reason in matters of religion. Whilst the history of the term Rationalism is confessedly hard to trace, the first technical use of *rational*, to express a school of philosophy, seems to have taken place early in the seventeenth century. Into this use it had probably passed out of the old sense of *dialectical*

Passing into Germany, Rationalism appears to have become the common name to express philosophical views of religion, as opposed to supernatural, in which sense it is ascertained to have been used so early as 1708. The name has often been appropriated to the Kantian, or critical philosophy, in which Rationalism was distinguished from that variety of so-called Naturalism which maintained the sufficiency of natural religion to the discredit of revelation. During the period when Rationalism was predominant as a method in German theology, the meaning and limits of the term were freely discussed—a period which may be taken as occupying the interval when the Wolffian philosophy had given place to the Kantian, and the philosophy of Fichte and Jacobi had not yet produced the revival under Schleiermacher. This form of Rationalism also continued to exist during the lifetime of its adherents, contemporaneously with the new influence created by Schleiermacher.

The sources and the forces of the Rationalism which found its typical arena in Germany were various. The deism of England, as pointed out by Bishop Hurst, the leading American historian of Rationalism, one of the most polished and powerful of all forms of free thought, was industriously propagated in Germany, where the works of Lord Herbert, Hobbes, Shaftesbury, Tyndal, Woolston, and Wollaston were widely circulated amongst the people in their own vernacular. 'In Holland,' says Dr. Hurst, 'the philosophy of Descartes and Spinoza was very powerful, and its influence was very decided east of the Rhine, particularly in the universities of Germany. The pantheism of Spinoza was very attractive to many minds, and was regarded as a welcome relief from the cold and heartless banishment of God from His own creation. France, however, was the chief foreign country which contributed to the rise and sway of German Rationalism. The influence of Voltaire and the Encyclopædists was very great, and Berlin became as much a home to these men as Paris had ever been. The domestic causes were, first of all, the philosophy of Leibnitz, popularised and simplified by Wolff at Halle University; the destructive theology of Semler; the influence of the sceptical court of Frederick the Great, with its French surroundings; the *Wolfenbüttel Fragments*, published by Lessing, and the *Universal German Library*, issued by Nicolai. Rationalism was in the ascendant in Germany from 1750 to 1800, but with the beginning of the new century it began to lose its hold upon the best minds. Schleiermacher was the transitional theologian from the old rationalistic to the new evangelical faith of Protestant Germany.

The Kantian philosophy did but bring forward into light, imparting to it at the same time a scientific form and recognised position, a principle which had long unconsciously guided all treatment of religious topics both in Germany and in England. Rationalism was not an anti-Christian sect outside the Church, making war against religion; it was rather a habit of thought ruling all minds under the conditions of which all alike tried to make good the particular opinions they might happen to cherish.

If we are to put chronological limits to this system of religious opinion in England, we might, for the sake of a convenient landmark, say that it came in

with the Revolution of 1688, and began to decline in vigour with the reaction against the Reform movement about 1830. Locke's first publication of his *Reasonableness of Christianity*, 1695, would thus approximately open, and the commencement of the issue of the *Tracts for the Times*, 1833, thus approximately mark the fall of, the *régime* of Rationalism. 'Not that chronology,' as the Rev. Mark Pattison has pointed out, 'can ever be exactly applied to the mutations of opinion; for there were Rationalists before Locke,—e.g. Hales of Eton, and other Arminians; nor has the Church of England unanimously adopted the principles of the *Tracts for the Times*.'

It is when it is found as a dominating factor in theology that the profoundest and most momentous significance attaches to the action of the spirit of Rationalism; a significance which, for the purpose of this article, is intensified when Rationalism determines the quality of the religious truths and systems in which the young are to be instructed, and the methods by which their education is to be ruled and accomplished. Contemporaneously with the series and succession of literary influences which were the soul of the power and prestige of Rationalism, and which may be said to have culminated with the constellation of genius that has illustrated for ever the otherwise humble archives of Weimar, there was a gradual transformation of the training and instruction of the youth of Germany, the saturation of whose minds with doubt seemed all that was needed to complete the sovereignty of scepticism.

Two leaders in this movement are entitled to special attention, Basedow and Nicolai, the former eminent as an innovator in the department of education, and the other in that of periodical and popular literature. The education of youth and the periodical popular press are both agents on whose relation to the Church much is dependent; and at the time in question 'the school,' in the words of Dr. K. R. Hagenbach, 'stood under the sceptre of the Church, and periodical literature under a censorship. But now began a change: education claimed to be independent of the fostering care of the Church, and a broad current of literature spread over a domain of life which had hitherto been familiar only with the Bible, a few books of devotion, and some scanty and barren facts of science. The new educational system and the new popular philosophy played into each other's hands, and contested the right of the Church to be the only instructor of youth, the only guardian of the people. Not content with that, after they had gained an independent existence, they turned their united forces *against* the Church. The ancient edifice, with its Gothic towers and windows, with its gloomy aisles and monuments, seemed to be no longer a fitting place for the instruction of light-hearted childhood; the church must become a cheerful schoolroom, the quaintly carved pulpit, with its stone staircase, must be transformed into the awkward desk. It would be hard to say whether this great change would more fitly call out the song of triumph of one, the elegy of another, or the satire of still a third. For my own part, I consider it a matter alike worthy of joy and of sorrow, and to treat it thus is the duty of the impartial historian.'

It will not now be disputed that there were serious defects in the educational system of the time; and that a great reform in education was needed. The Latin schools instituted by Melanchthon were still in existence, but they had become mere machines. Children were compelled to learn by heart particulars the least interesting. The most useless exercises were elevated into great importance; and years were spent in the study of many branches that could be of no possible benefit either for the handicrafts or the professions. The primary schools were equally defective. There was no such thing as the pleasant, developing influence of the mature over the youthful mind. The religious education of youth, to instance a general statement in one vital particular, had been narrowed down to the mere committal of the catechism to memory, and the crowding of the mind with Biblical and theological details which were admirably calculated to remain undigested in their primary receptacle, and utterly without assimilation with the intellectual life into the overladen organisms of which they were intruded. There was little in the educational field of Germany from which good could be expected. Up to the time of the eighteenth century, there was no true science of education. What hitherto, had been left to nature,

to habit, and to traditional prejudices, had to be corrected and raised to the place and dignity of an art. Good elements had to be reduced to laws, and evil elements had to be excluded. It was necessary to regard man as a whole, as truly man; and his education was incomplete if it did not involve or attain a symmetrical development of body, mind, and soul. It was a noble task, but a difficult one—one to whose accomplishment the rapid years of a single century, whatever its degree of enlightenment might be, was all unequal.

Certainly such a process, as pointed out by Dr. Hagenbach, could not be effected 'without deadly offence to every conservative influence of society; and as the goal of every educational process is religious development, it is not to be wondered at that this new movement produced instant strife with the theologians—for the ground principles of education are connected in the most intimate manner with the views which are taken of the nature of man. Whoever adopts the old doctrine of human depravity must insist on education as a process from without, inward. Its work must be to break the natural will, as if it were a hard and petrified thing, and to do it, if need be, by the sternest measures. The historical and doctrinal elements of Christianity, according to this view, cannot be too early impressed upon the soul of the child, and it is of prime importance that they be held as an imperishable possession. Whoever, on the other hand, adopted the new ideas which began largely to prevail, regarded human nature as a germinating seed in which a good and noble impulse dwells, and requiring only fostering care, the educational process going on from within, outward. Religion was not only to be carried into the soul of the child, but was also to be drawn from that soul, and only so much was to be carried in as was adapted to its immature grasp, and to the necessity of adequate inward stimulus. Very speedy, however, was the transition from one extreme to the other, from the denial of human sensibility to goodness, to the denial of sin and a fallen nature; from an overestimate of historical and positive Christianity, to an underestimate of the same. Then came another change. The old educational system had borrowed much from the Church; to promote the interests of the Church was its great end. A large proportion of all the studies of the gymnasium and the university looked towards theology and the clerical profession—hence the value laid on the ancient languages; but the modernised educational scheme aimed at educating men for the world and for practical life. For what use, then, it was said, are the ancient languages and ancient history? Even men of the most rigid orthodoxy, like Frederick William I., expressed themselves against the study of Latin; and further, even Thomasius had declared the uselessness of it for those who were not students by profession. Thus education was transferred from a narrow ecclesiastical field to broad cosmopolitan ground, from a positive Christian basis to a so-called philanthropic one. Rousseau had given a great impulse to this movement by the publication of his *Emile*. Basedow was his interpreter and advocate in Germany. To Basedow succeeded Saltzmann and Campe; to them the more noble and reliable Pestalozzi.'

The great tendency of the Rationalistic movement was to refer everything to the standard of practical utility, under the influence of which the homiletics of the day exhibited a reaction against the stiff and formal presentation of mere doctrine, and in favour of the inculcation of simple ethical practices and principles. The pulpit became moral, benevolent, beneficent, philanthropic, and, withal, characteristically secular, the vehicle for the dissemination of little more than that kind of instruction which tended to make people happy in this world, honourable and useful as citizens, dutiful as children, obedient as servants, dignified and paternal as heads of families. To the prophets and interpreters of utility, the interests of the heart and the emotional nature were the amiable disguise of a foolish and goalless fanaticism. All thought of the supernatural and of the unseen world was evaded, or crowded to one side, if, indeed, it were not alternatively confronted as being antagonistic to popular elevation and enlightenment. Sermons were everywhere preached which were conversant about such subjects as the care of the health, the necessity of industry, the advantages of scientific agriculture, the expediency of acquiring a competence, the correlative duties of superiors and subordinates, the evil effects of litigation, and

not least, the folly and imbecility of superstition of fact or of opinion. The tradition is still extant that the season of Christmas was turned to account to lead up from the pathetic story of the Child born in a manger to the most approved methods of feeding cattle; and that the appearance of Jesus walking in the garden at daybreak on Easter morning was used to enforce the benefits of early rising, and of taking a walk before breakfast.

Pestalozzi, the 'schoolmaster of the human race,' is currently regarded as worthily occupying the first place on the roll of the educational reformers who flourished during the meridian strength of the Rationalistic movement; in common with whose adherents he believed in man's natural goodness, and maintained that true education consists not so much in the infusion or incorporation of what is foreign to the nature or character of the child, as in evolving or educing what is native and inherent in the same. But he warmly advocated an early acquaintance with the Bible, and held the history of Christ to be an indispensable ingredient in the training of the youthful mind. But while Pestalozzi and a few others of a kindred spirit were contributing by their writings and their practical energies to the improvement of the youth of Germany, there sprang up a large class of writers whose morbid and multitudinous productions are described as having been as plentiful as autumn leaves. Some of these were sentimental, having imbibed their spirit from *Siegwart*, *La Nouvelle Héloïse*, and similar works. Their influence worked in the direction of converting young men and women into mere dreamers, and children of every social condition were unwholesomely forced into becoming precocious and portentous speculators about love, romance, and suicide. 'Whoever could wield a pen,' says Dr. Hurst, 'thought himself fit to write a book for children. There has never been a period in the whole current of history when the youthful mind was more thoroughly and suddenly revolutionised.

'The teachers in the common institutions of learning having now become imbued with serious doubts concerning the divine authority of the Scriptures, their pupils suffered keenly from the same blight. In many schools and gymnasia miracles were treated with contempt. Epitomes of the Scriptures on a philosophical plan were introduced. Ammon, in one of his works, tells the young people that the books of the Old Testament have no divine worth or character for us, except so far as they agree with the spirit of the Gospel. As to the New Testament, much must be figuratively understood, since many things have no immediate relation to our times. Christ is a mere man. Dinter was a voluminous writer on theological subjects, and in his books tells children of imperfect notions of former times as to God, angels, and miracles. He gives teachers directions how to conduct themselves cleverly in such matters, and afterwards, in agreement with the principles he recommends, he lays down plans of catechising. For example, there are to be two ways of catechising about Jonah; one before an audience not sufficiently enlightened, and where all remains in its old state; another for places which have more light. In the prophecies concerning the Messiah, a double explanation is given for the same reason. One is the old orthodox way, the other a more probable neological plan. A clever teacher is to choose for himself; a dull one may ask the parish clergyman how far he may go.'

But educational Rationalism, or Rationalism as expressed in systems or methods of education, besides its religious ancestry, has also a secular and philosophical succession. In this connection the formal origin of modern European Rationalism has been regarded as approximately coincident with the first publication of the *Essais* of Montaigne in 1580. It was Montaigne who raised the earliest articulate protest against the pedantry into which, as if by a necessity of their organisation, the schools of his time, whether those of the older Church or of the Reformation, had degenerated. Montaigne was the advocate of common sense in the direction of practice rather than theory, of wisdom as contradistinguished from learning; of a general or liberal, rather than a professional or technical type of education, with a tendency to the secular as a reaction against what had been almost exclusively ethical and religious; of informal instruction from natural objects, and of first-hand observation and knowledge, as against the formal didactic instruction out of books, the result of which was knowledge at second-hand only; of the conception of education

as a process of growth rather than of manufacture; of teaching whose purpose should be, not the aggregation of unordered facts, but the formation and training of character; and of a comparatively mild and humane discipline in substitution for a rule that was harsh and repellent, with the consequence, involved in the former, of the substitution of a finer code of conduct and civility for the antecedent rudeness and coarseness of manners and disposition. He conceived of the ideal tutor as one gifted to draw out the pupil's own power and originality, to teach how to live well and to die well, to enforce a lesson by practice and example, to put the mother tongue before foreign languages, to teach all manly exercises—in short, to educate the perfect man. He deprecated force and compulsion, and he denounced severity and the rod. 'Notwithstanding some grave defects,' Dr. Compayré concludes that 'the pedagogy of Montaigne is a pedagogy of good sense, certain parts of which will always deserve to be admired. The Jansenists, Locke, and Rousseau, in different degrees, drew their inspiration from Montaigne. In his own time, it is true, his ideas were accepted by scarcely any one save his disciple Charron, who, in his treatise, *De la Sagesse*, 1595, has done little or nothing more than distribute in methodical order the thoughts scattered throughout the *Essais*. But if he had no influence on his own age, Montaigne has at least remained, after three centuries, a sure guide in the matter of intellectual education.'

More than a hundred years after Montaigne, John Locke, whose name may be cited in brilliant illustration of the facility of the transition from philosophy to education, made a still more powerful and systematic attack upon useless knowledge. His work, entitled *Some Thoughts Concerning Education*, 1693, has enjoyed a universal acceptance and success; and the hearty and discriminating praise of Leibnitz placed it above another and more celebrated treatise of the same author, published three years before, under the title of an *Essay Concerning Human Understanding*, 1690. Locke sets before himself the production of the man; and the desiderated result of education as the ensuring of a sound mind in a sound body. 'He recommends home education,' in the words of Mr. Oscar Browning, 'without harshness or severity of discipline. Emulation is to be the chief spring of action; knowledge is far less valuable than a well-trained mind. He prizes that knowledge most which fits a man for the duties of the world, speaking languages, accounts, history, law, rhetoric, natural philosophy. He inculcates the importance of drawing, dancing, riding, fencing, and trades. The part of his advice which made most impression on his contemporaries was the teaching of reading and arithmetic by well-considered games, the discouragement of an undue compulsion and punishment, and the teaching of language without the drudgery of grammar. In these respects he has undoubtedly anticipated modern discoveries. He is a strong advocate for education under a private tutor, and his bitterness against public schools is as vehement as that of Cowper.'

The doctrines of Locke exercised an undoubted influence on the educational writings and theories of Rousseau, with their defiance of convention and their social aggression, and on the treatise of Claude Adrien Helvétius, entitled *De l'Homme; de ses Facultés intellectuelles et de son Éducation*, 1772. Helvétius pressed the characteristic formula of Locke into a systematic paradox, which claimed for education that it is omnipotent, the sole cause of the difference of one mind from another. The doctrine of Helvétius is the *reductio ad absurdum* of sensationalism. The mind of the child is but an empty capacity, something indeterminate, without predisposition. The impressions of the senses are the only elements of intelligence; so that the acquisitions of the five senses are the only thing that is of moment. The senses are all there is of man.

The name of Rousseau is one of the most prominent and suggestive in the entire hierarchy of Rationalism as applied to education; and there is no book which has had more influence on the education of later times than his *Émile, ou de l'Éducation*, which was published in 1762, and presently produced an astounding effect throughout Europe. The burden of Rousseau's message was nature—such a nature as never did and never will exist, but still a name for an ideal worthy of human endeavour. 'It is, perhaps, strange,' as Mr. Oscar Browning pertinently remarks, 'that a book in many respects so wild and

fantastic should have produced so great a practical effect. In pursuance of its precepts children went about naked, were not allowed to read, and when they grew up wore the simplest clothes, and cared for little learning except the study of nature and Plutarch. The catastrophe of the French Revolution has made the influence of *Émile* less apparent to us. Much of the heroism of that time is doubtless due to the exaltation produced by the sweeping away of abuses, and the approach of a brighter age. But we must not forget that the first generation of *Émile* was just thirty years old in 1792; that many of the Girondins, the Marseillais, the soldiers and generals of Carnot and Napoleon, had been bred in that hardy school. There is no more interesting chapter in the history of education than the tracing back of epochs of special activity to the obscure source from which they arose. Thus the Whigs of the Reform Bill sprang from the wits of Edinburgh, the heroes of the Rebellion from the divines who translated the Bible, the martyrs of the Revolution from the philosophers of the Encyclopædia.'

The *Émile* of Rousseau was the point of departure for an awakened interest in educational theories which has continued to the present day. For thinkers of eminence during the last hundred years have failed to offer their contributions, either of set purpose and directly, or at least incidentally, on this subject. Poets like Richter, Herder, and Goethe; philosophers such as Kant, Fichte, Hegel, Schleiermacher, and Schopenhauer; psychologists such as Herbart, Beneke, and Alexander Bain; sociologists like Herbert Spencer, not to mention the more obvious names of professors of pedagogy, like Payne, Meiklejohn, and Laurie, have left or promulgated directions for our guidance which are more or less permeated or influenced by that spirit of Rationalism which it is hard, if not impossible, to think away from any single moment of the unbounded future of education. The teaching of Rousseau found its practical expression in the Philanthropinon of Dessau, a school founded by Basedow, the friend of Goethe and Lavater, which received the praise of the philosopher Kant and of Oberlin the clergyman Basedow, the principles of whose instruction were very much those of Comenius, which centred in the combination of words and things, may be regarded as the typical innovator in the direction of rationalistic education; and, glaring as his faults may have been, he succeeded in effecting radical changes in the entire circle of youthful training. Professor Max Müller, who made an interesting public reference to him at Manchester, in 1875, in which, with something more than content and complacency, he claimed Basedow as his 'own *atavus*, or, at all events, his great-grandfather,' claimed him also as 'the first reformer of our national education, as the forerunner of Pestalozzi, as the first who, during the last century, stirred up the conscience of the people of Germany and of their rulers, and taught them at least this one lesson, that, next to the duty of self-preservation, there is no higher, no more sacred, duty which a nation has to fulfil than national education. . . . Basedow's was a chequered life, as the life of all true reformers is sure to be. Perhaps he attempted too much, and was too much in advance of his time. But, whatever his strong and whatever his weak points, this one great principle he established, and it has remained firmly established in the German mind ever since, that national education is a national duty, that national education is a sacred duty, and that to leave national education to chance, church, or charity, is a national sin. That conviction remained ingrained in the German mind even in the days of our lowest political degradation; and it is to that conviction, and to the nation acting up to that conviction, that Germany owes what she is, her very existence among the nations of Europe. Another principle which followed, in fact, as a matter of course, as soon as the first principle was granted, was this, that in national schools, in schools supported by the nation at large, you can only teach that on which we all agree, hence, when children belong to different sects, you cannot teach theology.'

The torches lighted at Basedow's flame, some of which have burned with a steadier and purer light than that of their original source of illumination, have been passed on from hand to hand and from generation to generation. At the present moment the typical expression of the rationalistic spirit, as against precedent in education, is to be found in the demand for at least the co-ordination generally, and, more definitively, in the sphere of academical dignity and reward, of the study of

Tracts for the Times, No. 73, by Dr. Newman; Rev. Mark Pattison's *Tendencies of Religious Thought in England*, 1688–1750, in *Essays and Reviews*, 1860; Rev. Adam S. Farrar's *Bampton Lectures for* 1862, *A Critical History of Free Thought in Reference to the Christian Religion*, 1862; Professor K. R. Hagenbach's *German Rationalism*, 1865; W. E. H. Lecky's *History of the Rise and Influence of the Spirit of Rationalism in Europe*, 2nd ed. *Education* in the *Encyclopædia Britannica*, 9th ed., vol. vii., 1877; Rev. Dr. Charles Beard's *Hibbert Lectures*, 1883, *The Reformation of the Sixteenth Century in its Relation to Modern Thought and Knowledge*, 1883; Professor Gabriel Compayré's *Histoire de la Pédagogie*, 1883; Robert Kübel's *Rationalismus und Supernaturalismus*, in Herzog's *Real-Encyclopädie*, 1883; and others.)

Untruthfulness. *See* TRUTHFULNESS.

V

Vacation Schools.—The new vacation schools involve attempts to solve some of the difficulties in connection with the children of the worst 'home' surroundings. Attendance is not compulsory, neither is ordinary discipline possible. The primary object of such schools is to substitute healthful and stimulating occupations in place of the demoralising influences of idleness and vicious surroundings to which the poor children, especially in large cities, are peculiarly exposed. It is bad economy for the State to allow the good done at school to be undone at home. The present system of 'too much book and too often parrot' intensifies the evil. To give an instance of recent attempts to lessen it, we learn from the Industrial Education Association (9 University Place, New York) that 'in three schools held in the city in July and August 1886 over four hundred were instructed in drawing, modelling, construction, wood-carving, sewing, and cooking.' A lady enthusiast superintended the whole, and both boys and girls cheerfully submitted to the necessary restraints. (*See* MANUAL TRAINING.)

Vacation Term.—A name given to a voluntary and conditional period of residence and courses of lectures at Cambridge for honours men in the Long Vacation. There was none at Oxford in 1888. Selected parties of teachers have, however, recently resided by permission in colleges in Oxford and Cambridge, and received unofficial courses of lectures, &c., from heads of houses and tutors in sympathy tures create a thirst for such visits to the university itself.

Vanity, Pride, Self-esteem.—These terms refer to varieties of feeling which have a common root in self-love and self-regard. The child instinctively attaches a value to all that concerns itself, and when a distinct consciousness of self is developed this instinctive disposition passes into a feeling of self-liking or self-attachment, which is analogous to its love for others. This feeling is at once the source of the pleasures of self-complacency and of the pains of wounded *amour propre*, &c. At first, owing to the weakness of their judgment, children are disposed to estimate themselves and their actions by the opinion of others. Self-gratulation is at this period largely the reflection of others' complacency. The most general name for this dependence on others' approval is the love of approbation. It is at once the source of one of the most valuable motives of childhood and of one of its greatest weaknesses. Kept within proper bounds, and rendered intelligent and discriminating, this regard for others' opinion is one of the educator's principal aids. On the other hand, when unchecked and undiscriminating, it grows into a foolish and hurtful vanity, or love of admiration. Vanity means an excessive self-consciousness, an over-estimate of some personal quality, as good looks, and a too eager desire for others' admiration. This last fault is still more conspicuous in ambition and thirst for glory, though here another impulse, viz. emulation, co-operates. A

telligence, and so developing a certain selectiveness in the enjoyment of praise, and a power of discriminating empty flattery from just recognition of worth; and, finally, by exercising and strengthening it in self-judgment and self-esteem. As the child grows to the age of independence it must learn to rely less on others' good opinion and more on its own. This self-esteem is necessary to the higher developments of moral character. A good will, that chooses right independently of the value set on it by others, implies that the subject finds an adequate reward in the feeling of self-approval. A proper feeling of self-respect, or pride, which leads a boy to despise what is small, mean, and tricky as unworthy of him, or beneath his dignity, is one of the most valuable of moral safeguards. In encouraging this self-esteem and this sense of personal dignity the educator must be careful not to foster an excessive and cynical disregard for others' approval, which is a blemish in all cases, and in the case of the young is particularly baneful. (Cf. articles HONOUR, PRAISE AND BLAME, SELF-LOVE. *See* Bain, *Mental Science*, bk. iii. chap. vi.; Sully, *Teacher's Handbook*, p. 384 following; Miss Edgeworth, *Practical Education*, chap. xi.; Pereez, *L'Éducation dès le Berceau*, chap. vi.; Beneke, *Erziehungs- und Unterrichtslehre*, §§ 61–63; Waitz, *Allg. Pädagogik*, p. 170 following; cf. art. 'Eitelkeit' in Schmidt's *Encyclopädie*.)

Varro Marcus Terentius. *See* ROMAN EDUCATION.

Ventilation of Schoolrooms. — The limit of impurity of air has been fixed at ·06 per cent. of carbonic acid, i.e. 6 parts in 10,000 of air. In order to maintain the carbonic acid at this level, 3,000 cubic feet of pure air are required per hour by every adult, and at least half as much should be supplied for children. With the 15 square feet of floor space (and 10 feet height of schoolroom) which we have fixed as our minimum standard, it is evident, therefore, that the air must be changed ten times in every hour, which, owing to draughts, can only be done during the greater part of the year by combining some form of warming apparatus with the ventilating arrangements. The temperature of the air varies

schoolroom is from 60° to 65° Fahr. An over-heated room (when heating apparatus is not properly regulated) causes the children to perspire, and makes them very prone to catch cold on the slightest exposure to draughts. Two plans of ventilation are described, natural and artificial ventilation. In the former the natural movements of the air through openings are utilised; in the latter the natural movements are aided by warming apparatus or mechanical appliances. The great problem of ventilation is to secure a sufficient interchange of air without causing draughts. Owing to the great difference in temperature between the air within and without a house this is impossible during the winter months, unless the incoming air is warmed. Open *windows* are the best means of ventilation, and during the school recess all the windows should be thrown open, if possible opposite windows and doors, in order that the rooms may be thoroughly flushed with air. A down-draught from a window may be prevented by having its upper segment to work on a hinge, the current of air being directed upwards; or by deepening the lower beading of the window or placing a block of wood under the lower sash, so that an upward current of air may be allowed between the two sashes. The *wall* may be utilised by inserting a grating near the floor, and connecting it on its inner aspect to a vertical tube (*Tobin's tube*), a vertical direction being thus given to the incoming air. Or the grating may be placed higher up in the wall, a movable valve, such as Sheringham's, on the inner side of the wall directing the current upwards. The ventilation is much more likely to be successful if there are openings on opposite sides of the rooms, or if there is a chimney or other draught-compeller in the schoolroom. Indeed, a *chimney* should always be allowed for each room, even when it is not contemplated to have open fires. An up-current always exists in a chimney-flue, if there is free ingress of air by doors and windows. Boyle's or Arnott's valves placed above the fireplace, and opening into the flue, are of some service in withdrawing the hot, impure air which tends to accumu-

forated, and gratings in the external wall to correspond with the space between the ceiling and the floor of the room above. Where gas-burners are used they should be of a kind that carry off the products of combustion, and thus help in ventilating the room. (*See* WARMING APPARATUS and IMPURITIES OF AIR.)

Verse-Writing. — Few educational questions were in the early days of the attack on the classical system of education more warmly debated than the value of learning to write Latin verses. There is no doubt much to be said on both sides, though it does not necessarily follow that the practical conclusion is doubtful or nicely balanced. Unfortunately the attack often ignored some of the really beneficial results of verse-teaching, and took too low ground in the educational dispute, while the defence was too narrow in its scope, and not practical enough in its educational views. In a word, the attack was often ignorant of the facts, and mercantile in aims; the defence was superfine in its theories, and prejudiced. I shall briefly re-examine the pros and cons from the point of view of a practical teacher, trained on the old Cambridge classical tripos system, who has taught Latin verses for twenty-five years.

In the first place we may concede at once that the accomplishment is useless. The people who are able and willing to read Latin poetry prefer the genuine Roman poets to the modern imitation. The Latin poetry of the contemporary Englishman is like the wax flowers of our grandmothers, or the glowing landscapes drawn by beggars on the pavement in coloured chalk. They are curiosities, not works of art; and the demand is very limited, if not extinct. An educated man may write them, as he may carve his pipe, build a snow-house, or compose acrostics; but he does it for exercise, amusement, or the mere delight in ingenuity. It is not, of course, the value of the completed product which is the serious plea for verses: it is the training. The differential calculus is also of no use to nine men out of ten who learn it; but it may

tary stage, where a boy of eleven to fifteen has to translate 'full-sense' English into such words as he can put into a line which will scan and construe. There is the second stage, say, from fourteen to eighteen, where he has easy English poetry to do, and is gradually mastering the resources of his metre, learning how to recast expression, and being initiated into the elements of taste, force, and melody of versification. There is the final stage, from seventeen to twenty-one, where he should be entering into the real spirit of poetry, and beginning to learn what style means, and how to convey feeling by words.

It is obvious that these stages run into one another. We have intentionally made the ages overlap, as the difference of boys' capacities at the same age is too striking a feature to be hidden, as it would be, under strict averages. Even in broad statements it should be kept before the mind. The last two stages are the hardest to discriminate satisfactorily in words; but there are facts to which they correspond. There is a point at which a young verse-writer can usefully try and fairly accomplish an easy narrative piece in the style of Ovid's *Heroides*. There is also a point at which he can fairly render a stanza of *In Memoriam*, which it would be futile to set before him earlier. Without attempting an impossible definiteness, these examples will show my meaning in speaking of the two later stages.

In the first stage the boy is learning *quantity*; not a useful thing in itself, but indispensable to any real appreciation of Latin poetry. It certainly is not necessary for the language, nor for learning to *read* Latin; and it might no doubt be learned later from Latin poetry itself, when a good many who now go through the course would have dropped out of the running. He is also practising the accidence; but that is far more effectively done by Latin prose. So far this is merely acquisition of knowledge, not faculty; the only exercise of faculty at this stage is what we may call the faculty of putting

latter, and neither much good nor much harm for the two former. It is not a bad exercise for them, and quickens their wits; on the other hand a good deal of time is spent which might be given to more important things. And it must be owned that nearly anything else is more important.

In the second stage the question is much more difficult, as there the good and the harm are both much greater, and much more judgment and care is required in the teacher to diagnose exactly what effect is being produced. Let us take the good first. Some boys will begin very quickly to show ease and faculty. The literary taste is inborn, and will infallibly show itself. Verse-writing will stimulate it, and train it, and feed it. The sort of general quickening and confidence which comes from feeling one's powers is such a powerful intellectual spur that it cannot but be good to use it. The only caution here necessary is that the verses should not be done too often, and that good English poetry should be given to turn. Weariness, empty facility, linguistic power apart from thinking, a fluency of slightly adorned commonplace, are the dangers; and they have been too often realised at classical schools. Some boys, again, of inferior power will work away, and achieve only moderate results. The advantage to these is, we think, real, and too often overlooked. In one word, they get a certain sense of *form* in expression. They cannot get this from prose, either read or composed, except later, more obscurely, and with more effort. They cannot get it from reading merely Latin poetry with anything like the same effect. It is a real thing; we have seen it grow; it transforms the boy slowly but deeply; it means the culture of the barbarian. It does not amount to much that can be shown; it puts forth no flowers; but it insensibly changes the boy's attitude of mind, opens a new vista to him, and its effects are lasting. The real difficulties here are two: first, to know how long with this sort of boy to continue the experiment before pronouncing it a failure, for it undoubtedly may take time. The master should consider this carefully, for the pressure of other studies is sure to be clamorous; and yet the loss to the boy if he miss what he might thus gain will be real, though it be materially imponderable, and though he may never know it. The c culty is that so much here tur teacher. We have known bc hopeless under a series of form finally caught hold of by the ve ing of one special man. We ha masters, even those otherwise inefficient, touch rank after ran mon boys presented to them literary enlightenment, purely their Latin verse-teaching. All teaching power is rare, but this rarest. Besides these two kind there will be the residuum, who a almost no good at this stage, and the verses are an affliction and time. If the verses are taugl these will be under the best tea haps a quarter, under ordinary half to two-thirds. Looking t they are—to capacity of boys, teachers, pressure of studies, range of learning, the material n say confidently that these boys cease writing verses.

We have spoken above of the ferior power, who yet get at this s first initiation into a *sense of fo* important question remains, wh could not get this as well fron (and writing) verses in their ow Some of the best authorities be they could; and that this, for of boys, is the real solution of question. Of course, it is true teachers are trained in one sy not in the other; that for finis a fully-inflected tongue like I special advantages; that the v of working in the resisting me strange language imparts pow even that an equal standard of n would look worse, and so be mor ing, in English. But these ar practical difficulties of detail, no able to effort, and all much ove by the single advantage of the ex age gained by working with th tongue. Indeed it is probable merely would the second class o their culture more easily, more and more fully, but that many siduum might be reclaimed. Tl ment has never, so far as we kı systematically tried, so that e is wanting. But it certainly attention. We will only remar the purposes of replacing Latin

essential that verses should be *written* in English, and not merely that boys should read, as they now do in most schools, a good deal of English poetry.

On the third stage there is no need to dwell at any length. It is approximately the stage of sixth-form life up to the end of the first two years at the university. It is tolerably plain by the beginning of this stage whether much good is to be gained by the patient continuing the treatment. The student's own taste is much more a factor in the decision; he will have begun to take his bent and show his faculties more clearly. Exemption from verse-writing is now in most schools easy at this age; scholarships and first-classes even in classics can be won without verses. The present writer's experience both of schools and university is that the exemptions should be more numerous still, from the educational point of view; and that of all students in this last stage who do verses barely half really profit by it. Of course, a school or college adviser has to consider success in examination; and he may often advise, and be right in advising, a fairly good verse-writer to continue the study, when from an educational point of view he had better drop it. The present state of things, however, is obviously transitory. The natural issue as regards the universities will be something of this kind: that the prizes for verse-writing will be kept for the most gifted scholars, that verse papers will be offered in university scholarships, that for college scholarships and classical examinations they will be optional. In the schools they will be still taught (at the last stage) to the most promising boys who like them and have a turn for them; the rest, though they may have got something from the second-stage training, will at this stage turn to more congenial pursuits. Even if the experiment above mentioned of substituting English for Latin verse in the lower parts of a school be tried, the Latin verses of the best sixth-form boys need not be abandoned. A good scholar, trained in poetic study—and such boys alone will try it—would easily in a few efforts reach the stage now achieved by prolonged apprenticeship of the more undeveloped mind. In a word, the early training of taste will be done by English verse, a fit instrument for the mass of boys. The few scholars will get the last finish by mature attempts at writing poetry in the languages they have already fairly mastered. (*See* also articles LATIN and PUBLIC SCHOOLS.)

Vested Schools. *See* LAW (EDUCATIONAL), section *Ireland*.

Victoria University. *See* UNIVERSITIES.

Vivâ Voce.—This is the name given to an examination by word of mouth, as distinguished from a *written* examination. The latter is mainly used with the object of ascertaining what knowledge each individual possesses, and how far, without prompting or suggestion of any kind, he can make use of particular parts of it. It requires the examinee to express himself at some length, and to show how far he understands the connectedness of his knowledge. The former—*vivâ voce*—aims rather at testing the general brightness and mental activity of an individual or a class; at ascertaining what degree of promptness and resource is possessed; what use can be made of knowledge freshly given or there and then recalled; and, lastly, the general attitude of mind towards knowledge. To a certain extent it tests the class-teacher's manner of work as well as the boy's ability. As far as it seeks to find out what *knowledge* is possessed, it should follow the lines laid down for the earlier stages of *oral instruction* (given under that title and under QUESTION AND ANSWER). It possesses the advantage that the questions can be rapidly and readily changed, modified, and varied; but there is also the disadvantage that the answers must necessarily be short and fragmentary, while the examinee unavoidably receives help and suggestion continually from the answers of others, and from expressions on their faces and on that of the examiner. Whatever of sequence and unity there is in the work is, moreover, due to the examiner for the most part; and so it is difficult by this means to make sure that the subject has been grasped as a whole—difficult, but not impossible. The great thing is to set the examinees at their ease to start with, to give them confidence and to loosen their tongues, which may be done by a cheerful greeting, a little general conversation, and perhaps even a little fun. When once they are set talking, the examiner should proceed as if he were giving an oral lesson, except that the subject is an old, not a new one; and that exposition should be

almost entirely omitted. In mathematics the examiner may sometimes discover all he wants to know by proceeding to give a *new* oral lesson on the stage *immediately following* the one arrived at by the class, particularly if this new stage is closely connected with those that go before. This, however, can only be done with those who have been set entirely at their ease. Unless the examinees are taken quite apart, and one by one, it is impossible to report individually on them when only *viva voce* is used. All that the examiner really gets otherwise is a general impression of the class as a whole.

Voluntary Schools are elementary and denominational schools not under the management of a School Board, but receiving Government grants. (*See* SCHOOL BOARDS and GOVERNMENT SCHOOLS.)

W

Warming Apparatus for Schools.—The best forms of warming apparatus are always combined with ventilating arrangements. The impure air of the room should not be warmed, but fresh cold air coming from without. Similarly, the warmed air which has been breathed and thus rendered impure should not be retained in the room, but carried off by exits as quickly as possible. This implies expense; the warm air is removed, and more warm air is required to take its place. If, however, in order to save expense in the heating apparatus the escape of warm impure air is stopped or diminished, the schoolroom becomes foul and unhealthy. It cannot be too clearly understood that an efficient and sanitary heating apparatus is necessarily expensive. The *open fireplace* not only furnishes a cheerful warmth to the room, but is also a valuable purifier of its atmosphere, as from 14,000 to 20,000 cubic feet of air pass up an ordinary chimney each hour. Its disadvantages are that the heat is unequally distributed in the room, and currents of cold air are produced along the floor in order to supply the place of the air which is rushing up the chimney. The latter can be prevented by having a free supply of warm air from some other source; and the great loss of heat from an ordinary fireplace can be prevented by admitting external air through chambers behind the fireplace, in which it is warmed as it enters the room. By this means (as in Galton's stove) an abundant supply of warm pure air is admitted above the chimney breast, and thence diffuses itself throughout the room. In small rooms gas is sometimes used for fires instead of coal. No gas-stove should be tolerated which does not provide for carrying off the products of combustion. A flue-pipe is even more necessary than for a coal fire, as, owing to the absence of smoke, the pernicious condition of the air might be overlooked. George's calorigen stove is a good example of a combination of a gas-stove with ventilating arrangements. A spiral tube communicates near the floor with the external air, and opens at its upper end into the room. A gas flame is kept burning under this tube, the products of combustion being carried outside by a separate tube; and the heat thus produced warms the air which is passing along the spiral tube, and causes it to enter rapidly into the room. *Closed stoves* are chiefly useful in small schoolrooms. They do not burn so much fuel as an open fireplace, and the combustion can be more easily regulated. Their tendency is, however, to make the air of a room too dry and produce a close smell, probably from the charring of minute particles of organic matter. If the stove is red-hot, or there are cracks in it, carbonic oxide gas, which is very poisonous, may find its way into the room. To avoid these evils firebrick should separate the fire from the ironwork, and the stove should never be allowed to become red-hot. There should be as few joints as possible, and these should be horizontal, not vertical. The products of combustion should never be prevented from, or delayed in, escaping by dampers, or by admitting air between the stove and the chimney. A bucket of water placed near the stove prevents the air becoming too dry. The only stoves permissible are those jacketed stoves which combine warming and ventilation. An outer casing around the stove communicates with the external air, and thus a large supply of pure warm air is introduced. For large schools a central system of heating is preferable. Hot air, steam, and hot water are the usual sources of heat employed. *Hot-air*

furnaces are usually unsatisfactory. Carbonic oxide and sulphurous acid not infrequently escape through leaky joints in the furnace, and thus the hot air supplied is irritating and impure. It is also generally very dry, though this may be remedied by placing water at the points of entry of air into the room. The air also is generally too hot, often at 140° Fahr. To cool the room the register is shut off, and the children are then obliged to breathe the same atmosphere repeatedly, or to have the windows open with consequent uncomfortable draughts.

Steam apparatus, if efficiently constructed and under the management of a skilled attendant, is very satisfactory. In the United States it is very commonly used, but in this country only exceptionally. Like other forms of heating apparatus it is only satisfactory from a sanitary standpoint when combined with the admission of pure air over the heating tubes. Each set of radiators should be arranged in several different sections, so that the flow of steam in any one of them can be cut off at will, and thus the amount of heating regulated according to the external temperature; or the air-flues may be so arranged that by movement of a valve the incoming air can be made to pass wholly in contact with the radiating surfaces, or separate from them in any proportion. *Hot-water apparatus* possesses some advantages over steam apparatus in the facts that the air passing over hot-water pipes is usually not raised above 100° Fahr. when the pipes are at a temperature of from 160°–180° Fahr., and that hot water continues to circulate some time after the fire is extinguished. In the high-pressure system the water in the pipes is heated to 300°–350° Fahr., in the low-pressure system not above 200° Fahr. Whichever of these systems is used, it should never consist simply of pipes placed in a room, from which heat radiates without any admission of fresh warmed air. This forms 'one of the most killing systems in existence.' By placing alongside the hot-water pipes flues for the entry of fresh air an efficient and thoroughly sanitary warming is obtained. The hot-water coils may also be arranged around the flues for carrying off foul air, thus increasing the rapidity of the exit current. If the rooms become too hot the remedy is not to close the points of entry for warm air, but to have valves by means of which the hot water can be cut off from any given portion of the hot-water pipes.

Weight of Children. *See* GROWTH.

Welsh Education.—In Wales no effective attempt was made to cope with popular ignorance till the Government began to pay grants in aid of local effort. The influence of the British and Foreign and of the National School Societies was little felt, for it was always difficult to raise money enough to establish schools, and generally impossible to raise enough to secure their efficiency. A record of the condition of affairs immediately after the issue of the famous Minutes of 1846 is found in the reports of the Commissioners appointed by the Committee of Council in that year. A motion had been passed by the House of Commons for an address praying the Queen 'to direct an inquiry to be made into the state of education in the principality of Wales, especially into the means afforded the labouring classes of acquiring a knowledge of the English language.' The Commissioners were entirely unacquainted with the speech of the people among whom their investigations were to be made, and consequently many of their facts and (what was perhaps more important) many of their impressions were obtained at second-hand through interpreters. Had they understood the Welsh language they would have better understood the Welsh character, and their criticisms (doubtless quite honest and friendly in intention) would have been more sympathetic without being less true. The publication of their reports was followed by an outburst of popular resentment; nor need we be surprised at this when we find the First Commissioner speaking of the 'widespread disregard of temperance, . . . of chastity, of veracity, and fair dealing' in Wales; the second speaking of the prevalence of 'drunkenness, blasphemy, indecency, sexual vices, and lawlessness'; and the third speaking of the 'social and moral depravity' of a part of the population. Still the reports (notwithstanding the objections which the patriots of the principality made to their tone) furnish a valuable record of the condition of education at the time. Bad as matters were in England they were still worse in Wales. Many large districts were totally devoid of schools of any kind. There were, for example, seventy-two

parishes in that state in the counties of Brecknock, Cardigan, and Radnor. Where schools did exist they were, in the majority of cases, of the sort known as 'private adventure.' Only about one-eighth of the schoolhouses were 'legally secured for educational purposes.' 'The teacher's dwelling-room, the kitchen of a farmhouse or part of an adjacent outbuilding, the loft over a chapel stables, churches and chapels themselves,' were frequently used for schools. A roof or floor without holes, a fireplace, a window that would admit sufficient light or any air were uncommon, and desks were a luxury to be desired rather than hoped for. The average income of the teachers was 22*l.* a year—1*s.* 3*d.* a day—and the most that could be said for them was that they were as good as could be expected for the money. A few of the best had received some kind of training; most of the others had taken to teaching because they were unfit for anything else. A list of their previous occupations embraces nearly a hundred trades and professions, while a great many callings were followed along with teaching. Among other things some of the masters and mistresses were broom and clog makers, cowkeepers, drovers, matron to a lying-in hospital, 'porter, barber, and layer-out of the dead in a workhouse,' publicans, and sextons. A number were in receipt of parish relief. It need hardly be said that these teachers knew nothing of teaching, and that in many cases they were themselves devoid of the rudiments of education. A great many of them could not spell, and not a few were so ignorant of the language in which they professed to carry on their schools, that the Commissioners had to communicate with them through interpreters. Registers were almost unknown; even in the 'model school' at Newport, Pembrokeshire, none was kept. Accurate statistics of attendance were therefore impossible, but there was ample evidence to prove that it was very irregular, and that the school life of a child generally began late and finished early. In one county, for instance, 63·5 per cent. of the children found in school had attended less than a year, and 21·9 more had attended less than two years. The poverty of the people accounted to a large extent for the extreme backwardness of education in Wales. Good schools cost money, which some one must pay. The parents of the children could nc all, and in most places there wa willing to help them. Hence the State aid was the beginning of a era, although the offer was not ver accepted at first. Many of the Di looked with distrust upon it, con it an indirect endowment of the or fearing ulterior motives on the the Government; but the judic ministration of the Education Dep gradually disarmed prejudice, an cations for assistance then beca quent. At the date of the Revis there were in the principality hundred schools which had receive ing grants, or were receiving annua and H.M. inspector was able tc that the 'prospects of educatio 'sufficiently hopeful and encou Still, till the passing of the Ed Act of 1870 the number of fell far short of the needs of the but Mr. Forster's great measure led immediately to extraordinary a The provision of accommodation efficient school for every child requ now became compulsory; but wer no compulsion in the matter the would have been much the same, denominational schools are displea the majority of Welshmen, and schools must be undenominationa 1887 the number of School Bo Wales exceeded three hundred, a number of elementary schools (Bos Voluntary) was nearly fifteen hun

The ample provision of schools children of the poor served to em by contrast the deficiency of scho the children of parents who could described as poor, and the still deficiency of the means of higher tion. The leaders of opinion in the pality, seeing no prospect of sup these deficiencies without some hel the State, tried to interest the Gover in the matter, and so far succeede obtain in 1880 the appointment of partmental Committee of Enquiry. committee consisted of Lord Ab (chairman), Viscount Emlyn, Prebe Robinson, Mr. Henry Richard, Pr Rhys, and Mr. Lewis Morris, and tainly would have been difficult t half a dozen men better qualified fo duties. Meetings were held in L and in the chief towns in Wale

pying over a thousand foolscap pages. With respect to intermediate schools the committee recommended: (1) That existing endowed schools should be made efficient and suitable. (2) That in the reorganisation of endowments (*a*) all schools should be made unsectarian; (*b*) the governing bodies should be, to a larger extent, properly chosen; (*c*) schools should be adapted to local requirements. (3) Where there were no endowments available, schools should be provided from other funds. (There was some difference of opinion as to the source of these.)

With regard to higher education the committee recommended: (1) That a university college for South Wales should be established in Glamorganshire. (2) That there should also be a university college for North Wales. For this purpose the college already existing at Aberystwith could be utilised where it was, or could be transferred to Carnarvon or Bangor. (3) A Government grant of 4,000*l.* a year should be made to each college. (4) The committee discussed the desirability of creating a university for Wales, but made no definite recommendation on the subject. The chief results of the labours of the committee were the retention of the university college at Aberystwith, the establishment of similar colleges at Bangor and Cardiff, and the grant of 12,000*l.* a year between the three institutions. No provision for intermediate education has yet been made, though several Bills dealing with the subject have been presented to the House of Commons. The provision of a Welsh university to complete, coordinate, and crown the whole system of Welsh education is perhaps not at present within the range of practical politics.

Though in many parts of Wales Welsh is the language of the home, the playground, the church, and the chapel, instruction in the grammar or literature of it has, till lately, been almost unknown, and, what is equally strange, Welsh has not been used in teaching English. When an English boy comes across a word which he does not understand his master substitutes simpler words for it; but to the Welsh boy no English words are simple at first, and an explanation in English for Utilising the Welsh Language. With the sanction of the Education Department, and with the hearty co-operation of some of the inspectors, several schools have tried the plan of studying Welsh and English together, and the constant translation from one to the other has been found to develop intelligence and give a large grasp of linguistic principles.

Wichern, John Henry, German philanthropist, born at Hamburg in 1808, was educated at the Gymnasium of his native city, and afterwards at Göttingen and Berlin (1830). Wichern's name is associated with the foundation of houses of rescue for destitute children in Hamburg and elsewhere. His object was to establish institutions in which the influence of the 'family organisation,' 'Christian training,' and 'industrial occupations' might be brought to bear upon the young. With this view Wichern took a small thatched cottage, called Rough House, a few miles from Hamburg, and commenced the undertaking with only three boys, whom he received into his own family. The number gradually increased, and Rough House became the parent of many similar institutions. Wichern's chief works are: *Flying Leaves from Rough House* and *The Inner Mission of the German Evangelical Church* (1849).

Wiese, Dr. L., in his *Letters on English Education* (1854), contrasts the German system of instruction with the English one. 'The result of my observations,' he writes, 'to state it briefly, is this: in knowledge our higher schools (i.e. the German higher schools) are far in advance of the English; but their education is more effective because it imparts a better preparation for life.' 'In England the first object of education is the formation of character.' 'The tendency of German education is to become encyclopædic.'

Wilderspin, Samuel. *See* Young Children (Education of).

Will, Self-Will.—The term 'will' is used in psychology to mark off the active tendencies and impulses of the mind, as distinguished from the intellectual capacities and the emotional sensibilities. The will exists in the child in a rudimentary form only. He has the instinctive dis-

shows this crudeness of will in his inability to realise and work for distant results, and the infirmity of purpose which follows from this; in his inability to deliberate and choose; in his want of self-control, and generally in the subjection of his desires to the external circumstances and solicitations of the moment. The growth of a rational and free will out of this inchoate childish will presupposes the development of the intelligence and of the feelings. Like the intellectual faculties, the will grows by successive exercises. The first and most important of these consists in self-submission to others, or obedience. Such obedience has, however, only a temporary function in furthering the growth of the will. Its higher developments presuppose liberty to reflect and choose for oneself. Hence the importance of restricting the area of authority in early life, and of gradually encouraging the child to think and act for himself. The instinctive bent to this free determination of action is seen in Self-will, or Wilfulness, which is so well marked a characteristic of all children that have a strong natural character and energetic impulses. Such self-will is not harmful in itself, but rather the expression of a strong and healthy individuality. It becomes bad, however, when it hardens into rebelliousness, refractoriness, or obstinacy—that is, a fixed disposition to defy authority as such, and to refuse to be led by others' superior wisdom. While in the case of the wilful and obstinate the educator has to impose restraint, in the case of those wanting in desires and energy of purpose he needs rather to rouse the will to activity. Since will is the source of all effort, intellectual and moral alike, it is evident that education, which proceeds by exciting the mind to activity, is concerned to a very large extent with prompting and directing the young will. (Cf. articles ACTIVITY, OBEDIENCE, SELF-COMMAND. For a fuller account of Will, or Volition, *see* Bain, *Mental Science*, bk. iv.; and Sully, *Teacher's Handbook*, chaps. xix. and xx. On the training of the Will and the management of Wilfulness, *see* Locke, *Thoughts*, § 78 following; Mrs. Bryant, *Educational Ends*, p. 20 following; Beneke, *op. cit.* §§ 71, 72; Dittes, *Grundriss*, § 69 and following; Pfisterer, *Päd. Psychologie*, § 33; and art. 'Wille' in Schmidt's *Encyclopädie*.)

Women-Teachers.—In all ages women have been recognised as the natural instructors of children in the nursery, though their function as educators in general has, until recent times, been less clearly defined. We hear, indeed, in the fifth century, of Hypatia, the reigning star of the Alexandrian school of the Neo-Platonists, lecturing to crowded audiences of men and women, and becoming in this way the spiritual father of the famous Proclus. But indeed Hypatia is at best 'but a myth and a shade,' and in the middle ages the education of women as a class was so restricted that only a few women-teachers were able to take up any prominent position. Bologna was the only university which granted degrees and other privileges to women. The learned and beautiful Novella d'Andrea, daughter of the celebrated Canonist, frequently occupied her father's chair in that university, and amongst other women professors at Bologna were Laura Bassi, who held the chair of mathematics and natural philosophy, the Madonna Manzolina, who practised and lectured on surgery with distinction, and Clotilda Tambroni, professor of Greek. On the great stairway of Padua stands the statue of Elena Cornaro, professor of six languages in that once renowned university. But Elena Cornaro was not educated by women, nor did she lecture to women. In the seventeenth century we find an attempt in France to replace the conventual education of girls by a more practical preparation for secular life. Louis XIV. was not fond of the convents, and, therefore, he liberally supported. Madame de Maintenon in her endeavour to place on a permanent basis the school she had founded for the daughters of the impoverished noblesse.

This was the origin in 1686 of the famous school of Saint-Cyr, which for many years numbered its 250 pupils, and whose scholars acted Racine's *Andromaque* so well, that he wrote for them *Athalie* and *Esther*. But Madame de Maintenon was an ardent disciple of Fénelon, and she came to the conclusion that his *Education des Filles* was not altogether in harmony with the kind of education that would produce such results, and she therefore, in 1689, soon entirely changed the character of the instruction and the discipline of Saint-Cyr, henceforth causing her pupils to devote more time to sewing and to what we now call domestic economy than to

Gréard assures us, was based on a sound psychology—a psychology not perhaps formulated, but drawn from exact and careful observation of child-life. Her organisation and discipline were as far in advance of those of other schools of her time as Montaigne's and Rousseau's theories (largely adopted by her) were in advance of theirs. 'The nature of the child may have been analysed more philosophically; I do not believe that any one has understood it better' (Gréard). Her successors at Saint-Cyr, unfortunately, are undeserving of mention, and the school disappears in the chaos of the Revolution.

The acquirements of an English schoolmistress of the same period can be gathered from the curious prospectus quoted by Dr. Doran in his *Lady of the Last Century*: 'A school founded in 1693 by Mrs. Makin, near Tottenham, High Cross, where . . . gentlewomen may be instructed in the principles of religion, and . . . in all things taught in other schools. As, work of all sorts, dancing, musick, singing, writing, keeping accompts; half the time to be spent in these things, the other half to be employed in gaining the Latin and French tongues; and those that please may learn Greek and Hebrew, the Italian and Spanish, in all which this gentlewoman hath a competent knowledge.'

The curriculum was also to embrace, if time were allowed, the whole circle of the sciences, concluding with arithmetic and history. Whether Mrs. Makin was able to perform all or any part of what she here promises we have no means of deciding; certainly we have no reason to suppose that a 'competent knowledge' of such subjects as Latin, Greek, &c., was common among the women-teachers of the last or of the beginning of the present century.

The changes that have taken place in the status of the women-teachers of England during the last forty years are the outcome of corresponding changes in the education of girls.

Until the establishment of public day-schools for girls of a higher grade than the elementary, the well-to-do classes sent their daughters to small private boarding-schools, or provided them with 'governesses' by intelligent and devoted women, who had supplemented their own defective education by general reading; but the very desultoriness of their own acquirements rendered any approach to method in their instruction exceptional. Their assistants for the elder pupils were usually 'masters,' partly owing to a lack of competent women-teachers, partly owing to a common prejudice in favour of the former, a prejudice which in those times no doubt had its foundation in facts, but which is rapidly dying out under the influence of the sounder education of women, and of more enlightened views as to the functions of the teacher. The women-assistants in these schools were, as a rule, ill-educated and unfit to conduct the education of even the younger pupils, who were usually committed to their care. Besides these boarding-schools there existed in every town a large number of small day-schools, kept by a still inferior class of women, who seldom had any other idea of teaching than that of 'hearing lessons' from a book.

It has been well pointed out that the low attainments of a teacher and his or her standing in society are reciprocally cause and effect. Society cannot honour the half-instructed governess, nor the incompetent schoolmistress; nor, on the other hand, will energy, ability, and high character seek a career in which little profit, little honour, and no advancement are to be found.

The intellectual result of this state of things is graphically described in the report of the Schools Enquiry Commission, 1867–68 (*see* EDUCATION OF GIRLS). The remedy was, among others, clearly indicated to the commissioners by Miss Wolstenholme, herself the head of a small school, and, therefore, not to be suspected of interested motives. In a paper written about this time she says: 'In the case of small schools all the difficulties of home instruction are aggravated. The experiment of large schools for girls has been successfully tried, and the results are conclusive as to the superiority of the system (so far as concerns day-schools) from whatever point of view we regard it. Their superior economy is obvious. But this economy cannot be estimated

Girls are prepared by their teachers for the university examinations open to them, and the standard of certificates obtained has been raised from year to year with that of the teaching in the schools. In the Cheltenham Ladies' College, which has passed through many stages of development during its thirty-five years of vigorous life, students who have passed through the school course are prepared for the Arts and Science degrees of the London University, and the subjects required are also taught chiefly by women. In the colleges founded exclusively for the higher education of women, the principals, as at Girton, Newnham, Somerville Hall, and Holloway College, &c., are women, and, though university professors give the lectures, the coaching is increasingly in the hands of women. At Girton College, for instance, there is a resident lady lecturer for each of the principal subjects studied for the Cambridge Triposes, and at Newnham classes are held by women in advanced subjects to which outside students are admitted. At Holloway, by the will of the founder, all the teachers are to be, as soon as practicable, resident mistresses.

The character of the teaching supplied by women has undergone no less a change than their position. In estimating the work done by the women-teachers of the present day, we cannot but recall the words of the Report of the Schools Enquiry Commission of 1867, complaining of 'the inattention to rudiments' in girls' schools, of their 'slovenliness and showy superficiality,' and contrast them with the verdict of the Oxford and Cambridge Joint Board of Examiners, when they report in 1887 to the Council of the Girls' Public Day School Company, that 'The examiner finds it hard to write without apparent exaggeration of the very high opinion he has formed of the general excellence of the literature work of these schools. At least four of the schools sent up work superior to anything of its kind which the examiner has ever seen before, except occasionally in the university examination of adults; while quite a dozen other schools followed close upon the excellence of these four.' In arithmetic, the examiner writes, 'I may say that I was very much astonished at the enormous improvement in the arithmetic of advance of the boys in style and accuracy as it was then behind.' And in other subjects the Board considers that the schools mentioned have now reached a high standard. The weight to be attached to the opinion of the 'Joint Board' will be apparent when it is remembered that it conducts the annual examination of all the best public schools for boys throughout the country, and that its certificate exempts from certain university examinations.

The salaries of the teachers in these schools vary with their position and qualifications. Several head-mistresses are receiving from 600*l.* to 700*l.* per annum; the maximum for an assistant is about 250*l.*; the average in schools such as those under the Girls' Public Day School Company being 120*l.*

It has been well said that the trained teacher brings something more to his or her task than the mere knowledge in which the untrained may often equal them. They bring a different appreciation of the work to be done, and definite methods of doing it. In consequence of the increasingly high standard in girls' education, and of the more enlightened views entertained concerning it, the need of professional training for all classes of teachers is beginning to be recognised. The Education Department has long demanded that elementary teachers of both sexes should submit to training (see Codes), and there are now twenty-six colleges for training female teachers in England and Wales. One of these, the 'Home and Colonial School Society's,' has a 'non-government' department professedly for training teachers of a higher grade; but the qualifications demanded of the candidates on entrance are insufficient, and, therefore, the need was unsupplied until, in 1877, the 'Teachers' Training and Registration Society' founded a college in Bishopsgate, London (since removed to Fitzroy Street and now known as the 'Maria Grey Training College'). To this the students are required to bring university certificates as evidence that their own education has been sufficiently thorough. It is a significant fact that while the college for men, founded by the same society, has been closed for want of students, the 'Maria Grey' has worked steadily since

seded in such schools by those of the other sex. The growth of public opinion in France in favour of women-teachers is indicated by the fact that a proposal to entrust women exclusively with the primary education of both boys and girls has already been discussed in the Chamber of Deputies.

Sweden rivals England in the advances made recently, and the fact that women are now placed by some of the universities on an equal footing with men will doubtless have its bearing on their position as teachers in the future. The United States of America furnishes a complete contrast to Germany in this matter. Not only are girls provided with excellent schools and women with colleges, besides many which admit both sexes (there were forty-six as early as 1874), but the education of both boys and girls is largely in the hands of women. In the mixed schools the head is usually a man, but the assistants are of both sexes, and the women are found to be quite equal to the work of advanced classes.

In view of the ever-increasing necessity for educated women to earn their living, it becomes an interesting question to consider their fitness for the work of teaching. Twenty years ago, in the report published by the Commissioners, Mr. Fitch said, 'Of two persons, a man and a woman, who have an equally accurate acquaintance with a given subject, it may be fairly assumed that the woman is likely to be the better teacher. All the natural gifts which go so far to make a good teacher she possesses in a high degree. In sympathy with learners, in the imaginative faculty which enables her to see what is going on in their minds, in the tact which seizes upon the happiest way to remove a difficulty or to present a truth, in insight into character, in patience and in kindness, she is likely to excel him. A larger proportion of women than of men may be said to have been born teachers, and to be specially gifted with the art of communicating what they know.' So also Mr. James Bryce, 'Women seem to have more patience as teachers, more quickness in seeing whether the pupil understands, more skill in adapting the explanations to the peculiarities of the pupil's mind, and certainly a nicer discernment of his or her character. They are quite as clear in exposition as men are, and, when well trained, quite as capable of making their teaching philosophical.'

These words were written at a time when women had seldom 'an accurate acquaintance' with anything, when high schools and women's colleges were unknown. A consideration worthy of some attention may be added to these weighty opinions. It has been urged as an inevitable disadvantage of women's work as compared with men's, that the prospect of marriage remains a near probability for many years of a woman's life, and deprives her of some of the settled resolutions with which a man enters upon the career which will remain his, whatever form his private life may take. Now of all bread-winning careers open to women, that of teaching is most closely allied to what most persons consider their natural vocation. Although a woman usually abandons her lucrative work when she marries, time spent in the schoolroom is a direct preparation for much of her work as a mother. A woman who has learnt before marriage the difficult art of controlling and instructing the young is prepared to do her duty as a mother with greater profit to her offspring and greater satisfaction to herself than one who has all to learn by bitter experience, and whose children must suffer for her mistakes at a time of life when they are most impressionable. Froebel advocated the training in the Kindergarten of all young women who intended to marry.

Word Method. *See* LOOK AND SAY METHOD.

Workhouse Schools. *See* CLASSIFICATION.

Working Men's College. *See* MAURICE.

Wrangler. *See* TRIPOS.

Writing.—Writing is the art of forming letters or characters on paper, slate, or other material. The act of learning to write is usually associated with the act of learning to read. Jacotot would set a child to commence writing 'after two lessons in reading'; Locke thinks that 'when a child can read English well it will be seasonable to enter him in writing'; La Salle requires that a child shall not be exercised in writing till he can read perfectly. We have already seen that practice in writing words is a great help to the mastery of the difficulties of reading and spelling, so that writing had better be begun pretty early. The systematic ma-

tell in the same direction. 'Children,' says Mr. Blakiston (*The Teacher*, pp. 17–18), 'should be supplied with sticks wherewith to form all letters that are made up of straight lines, then with rings and half-rings of cardboard to form letters like B, C, and P. After this they are to be encouraged to draw letters in *printed* characters on slates and blackboards. By such means children learn first the forms, then the powers, and afterwards the names of the letters with little trouble to their teacher, and with no little amusement to themselves.' There are many, however, who regard the first part of this exercise as over-elaboration. Among the ancient Hindoos 'exercises in writing were performed first upon the sand with a stick, then upon palm leaves with an iron style, and finally upon the dry leaves of the plane tree with ink' (Compayré, transl. Payne, p. 254). No harm will be done if the teacher at once places a pencil in the hands of the child, and shows him how to hold it. Mr. Blakiston would drill the infants from the very first 'to take up their pencils with the *second* finger and thumb; the forefinger should point upwards, and not be placed on the pencil until writing begins' (p. 18). The pupil 'must hold his pen or pencil about an inch from the point between the tips of the first and second fingers and the thumb, all extended nearly straight' (p. 38). No pencil should be shorter than four inches, when it gets shorter it should be lengthened by being fixed in a tin holder. 'It will be useful and timely in the beginning,' says La Salle, 'to give the pupil a stick of the bigness of a pen, on which there are three notches, two on the right and one on the left, to mark the places where his fingers should be put.' This good idea may be carried into effect in our own day by practice with holders furnished with arrangements for receiving the fingers in the proper positions, thus saving no end of trouble. Pencils first; then, after considerable practice and facility with the pencil, pens—good medium-points.

Now as to proper position. 'Before beginning to write,' says Mr. Blakiston (p. 39), 'the children should be told to make a quarter-turn to the right, place their left forearms on the middle of the desk, rest the fleshy part of their right forearms on the desk, with the third and fourth fingers bent inwards, to give some support to their right hands. If their wrists then lie as they ought to do, *rather flat than edgewise*, on the desk, the handles of the pens will point towards the right shoulder. They will now begin to write. As they write, the teacher will scrutinise each carefully, noting and at once correcting every deviation from any of the above instructions, and insisting upon every child *sitting upright, with head erect, and chest out*, and keeping his paper or slate straight, exactly as originally placed. Slates should not be tilted up during writing. As soon as a whole line of writing has been completed, they should be cautioned to push their slates or books upwards away from them, instead of (as is too commonly done) gradually lowering the right arm till the wrist, or even the hand, rests on the desk, when, of course, all power of writing freely is lost.' With ruled slate and pencil there is the advantage of greater mechanical ease; and if the copy is taken from the blackboard, under the direct supervision of the teacher, there is the further advantage of perhaps keener and more minute attention. But probably there is at least as much advantage in the outlined letters of the best copy-books, to be filled in with pencil. Alternations of exercise might secure all these advantages. Some teachers favour the plan of decomposing the letters into their elementary lines, and accordingly start their pupils with strokes and pothooks. It is well, however, to remember that strokes and pothooks get wearisome, and soon to give the infants complete letters, dropping the strokes and pothooks gradually. The practice in the letters should proceed from the simpler to the more difficult, similar formations being first practised together, and then contrasting formations together. The half-text hand is probably the best; the small-text is much too small for beginners, while the large text is too large for the easy reach of the small and unpractised fingers of the child. 'The proper inclination, dimensions, and distances of the letters,' says Professor Bain, 'are attained through a delicate sense of visible form which is very various in individuals, and it is best cultivated

by drawing exercises. This need not be pushed to an extreme point of delicacy for the ends of primary education; any very extraordinary endowment in the artist is likely to be attended with deficiencies in other important mental qualities. All pupils should be brought up to the point of plain passable writing, and should be made to put stress on the points that distinguish such letters as are apt to be confounded; it is not the schoolmaster's business to carry writing to the pitch of a work of art' (*Education as a Science*, page 237). This is the practical view; it is mere pedantry to urge that the equality of the spaces between letters and words 'should be occasionally tested by actual measurement' (Blakiston, page 38). *Locke's Method* is worth quoting, although the useful portions of it have been incorporated in the foregoing remarks. After directions how to hold the pen, and how to place the pupil's arm and body to the paper, Locke goes on to say:—'These practices being got over, the way to teach him to write without much trouble is to get a plate graved with the characters of such a hand as you like best; but you must remember to have them a pretty deal bigger than he should ordinarily write, for every one naturally comes by degrees to write a less hand than he at first was taught, but never a bigger. Such a plate being graved, let several sheets of good writing paper be printed off with red ink, which he has nothing to do but go over with a good pen filled with black ink, which will quickly bring his hand to the formation of those characters, being at first showed where to begin, and how to form every letter.[1] And when he can do that well he must then exercise on fair paper, and so may easily be brought to write the hand you desire.' *Mulhaüser's Method*, which once was in great vogue, carries the analysis of the lines of the letters to great extremes. It also demands a specially ruled copy-book, such as to afford the pupil the means of forming the characters by very accurate measurement of their parts. The fundamental lines are the straight line and the curve; the first written upwards or downwards, the last drawn to the right or to the left. Combinations of these give the loop and the crotchet. Eventually, from these four forms, are developed (with slight exceptions) the whole twenty-six. Each step is practised to facility, and new steps are added, while the first-learned steps are kept up. 'When the analysis is exhausted, the pupil still writes to dictation—that is, according to a dictation of the elements of the letters. If he were to write the word *dictate*, he would do so, not from copy, but from dictation of its several letters in this way: double-curve, straight line, two heights, link (*d*); straight line, link (*i*); curve, link (*c*); straight line, height-and-a-half, link, bar (*t*); double curve, straight line, link (*a*); straight line, height-and-a-half, link, bar (*t*); loop, curve, link (*e*); the whole forming the word *dictate*' (Currie, 342). According to the explanations of those who first introduced it into this country from Geneva, under the sanction of the Committee of Council on Education, this method 'consists in the decomposition of the written characters into their elements, and the classification of these elements, so that they may be presented to the child in the order of their simplicity, and that he may copy each of them separately. The synthesis, or recomposition of these elements into letters and words, is the process by which the child learns to write. He combines the forms which he has learned to imitate. He recognises each separate form in the most difficult combinations, and, if he errs, is immediately able to correct the fault. . . . The method enables the child to determine with ease the height, breadth, and inclination of every part of every letter. It would obviously be difficult to do this by rules alone, and such rules would not be understood by children, and would not be remembered without much effort. The method leads children to the result by practical expedients; and such rules as are desirable to rationalise these expedients are easily remembered as appendages to that which is recorded in the child's experience, though the rules would probably be forgotten if such practical demonstrations did not precede them.' So far as the method discourages the practice of complex before simple operations and en-

[1] 'Quintilian recommends, for the purpose of strengthening the child's hand, and of preventing it from making false movements, that he should practise on wooden tablets on which the letters had been traced by cutting.' (Compayré's *History of Pedagogy*, translated by Professor W. H. Payne (Swan Sonnenschein, Lowrey & Co.), page 49.) Saint Jerome also 'recommends that children should first practise on tablets of wood, on which letters have been engraved.' (*Ibid.* p. 67, note.)

courages an intelligent instead of a mechanical imitation of the characters, it is praiseworthy. But, as Dr. Currie points out, 'it fails from its being too rigidly a synthetic method; the analysis that is made for the first stages of elementary teaching should not descend to the smallest parts possible, but should stop at the smallest parts which the pupil can appreciate.' A further count against the method is, that 'the practice which it gives is extremely mechanical; so that, if the teacher can count on his pupils attaining through it a moderate average of attainment, he will be disappointed in expecting as its result a good style of the art' (Currie, 343.)

At the opposite pole stands *Jacotot's Method*. Jacotot would not set out with elementary lines, curves, and letters in text or half-text, but places before the pupil a complete sentence, either written by the master or engraved in *small-hand*, and requires him to copy this. Such a sentence is generally selected from the pupil's reading lesson, the two exercises being made to assist each other. The first word written, the pupil is led to compare in detail his own performance with his model for imitation, so that he becomes aware of his various shortcomings; the teacher making no positive criticism, but simply putting questions that lead the mind of the pupil to the desired conclusions. 'The principle must never be lost sight of, that *the pupil always corrects himself*. Each letter passes under a similar review, and the whole word is then written over again, the second and each successive attempt being subjected to the same rigid investigation, until the pupil learns to correct, in a greater or less degree, every fault as previously particularised by himself. He then goes on to the second word, in examining which the process just described is invariably employed; and so on with regard to the rest of the sentence, recollecting that every time a fresh word is taken the writing must commence with the first word written, that all the results of the attention previously bestowed may be embraced and preserved each time transcription, and that the pupil may fall again into any of the errors of wh he has already been made conscious. Wl the child begins to transcribe a sente or two tolerably well, he is required write from memory, and afterwards n his faults by comparison with the origi copy. After some considerable practic the writing of small hand, he is carr forward to exercises in the bolder sty of writing, while, at the same time, incessant maintenance of the princi originally urged upon him is on no acco to be looked upon as a matter of sli importance. He can never perform a thing so well but that with more pains may perform it better' (J. Payne, *Lectu on Education*, page 353). This met 'certainly involves the exercise of inte gence sufficient, as it would seem, to m success possible, in spite of the obvi complexity of the first models the pu imitate. But the objection to the met is this, that it does not cultivate specia the particular *kind* of intelligence whic good writing method should cultivate, *the intelligence of form*' (Currie, 344).

It will be interesting to quote fr Mr. C. C. Perry's *Reports on Germ Elementary Schools and Training Colle* the process employed in the German tra ing colleges. '*Task.*—Pupils are to acqui a plain, clear, and running hand, and a to learn to write neatly on the blackbo with chalk. *Method.*—The teacher fi writes the single letters, as well as th parts, separately on the blackboard. Th are next thoroughly discussed and descrit as a whole; practice then commences copy-books and on the blackboard, and partly carried out by counting. Corr tions are principally made in class, a are to help pupils clearly to recognise t mistakes they have made. As at t commencement chief stress is to be la on clearness, accuracy, and precision, in the further practice importance is to attached chiefly to the firmness and fluen of the writing' (page 111).

Wykeham. *See* PUBLIC SCHOOLS.

Young Children (Education of).—This article will deal with the education of *infants*, and as the term *infant* is variously applied, it may be well to state that here it means a child from about three to about seven years old. This is the sense in which the word is used by the Education Department.

A new-born infant is like the man who has lapsed into 'second childishness and mere oblivion—sans teeth, sans taste, sans eyes, sans everything.' Organs of sense it has, and they receive impressions, but as yet these impressions are not recognised, and consequently there can be no knowledge. Similarly there is no will, all actions being automatic and involuntary. The first dawn of intelligence comes when differences of feeling begin to be noted. The sensation of heat or of cold is first perceived, for example, when there is a change from one to the other. To the consciousness of unlikeness succeeds the consciousness of likeness, when sensations which have been experienced before are recognised on recurring. The repetition of sensations at length leads to the formation of ideas. 'Whatever the object of thought,' says Miss Youmans, 'to know in what respect it differs from all other things, and in what respects it resembles them, is to know all about it, is to exhaust the action of the intellect upon it. The way the child gets its early knowledge is the way all real knowledge is obtained. When it discovers the likeness between sugar, cake, and certain fruits—that is, when it disintegrates them in thought as *sweet*—it is making just such an induction as Newton made in discovering the law of gravitation, which was but to discover the likeness among celestial and terrestrial motions. And as with physical objects so also with human actions. The child may run round the house, and play with its toys; it must not break things, or play with the fire. Here again are relations of likeness and unlikeness, forming a basis of moral classification. The judge on the bench is constantly doing the same thing; that is, tracing out the likeness of given actions and classing them as right and indeed of childhood and of youth generally) is growth, physical, mental, and moral growth. This growth is the business of the present, and the hope of the future, and all that parents and teachers can do is to foster and protect it. Now growth presupposes two conditions, weakness and mobility, though indeed it may be objected that these two are only different aspects of the same condition, for an organism grows because it is weak, because something is lacking to it, while at the same time it grows because it has within it, constantly modifying it, a power of change, of formation and assimilation. All who have charge of the young should therefore remember that they are dealing with beings exhibiting sometimes the weakness of immaturity, and sometimes the force and spontaneity of growth. The teacher in particular should remember this double character of child-nature, and adapt his physical, mental, and moral training, on the one hand to the ever varying capacity of his pupils, and on the other to their ceaseless need of action and of change. He must take into account the limits which nature imposes upon their faculties, and likewise the imperative demand of those faculties for novelty, for recreation, and for movement. What he must avoid most of all is fatigue, which may arise either from work being too difficult, or from work not too difficult in itself being too long continued.

Importance of Infant Schools.—Where the physical and moral conditions of the home are good, where the parents have the ability, the time, and the disposition to exercise an intelligent supervision over their children, and where the period of formal education is not limited by the necessity of earning wages at the earliest possible moment,—where all these circumstances combine there is no need for infant schools, though even then a child may do worse than spend two or three hours a day in a kindergarten (*q.v.*) or other institution where amusement is intelligently directed towards instruction. In the case of a vast majority of our children, however, this happy combination of circumstances

it did nothing else, it keeps little ones out of mischief, and in large towns it gives them, instead of the discomforts of the home and the dangers of the street, pleasant rooms where the atmosphere is physically and morally healthy. Furthermore, an infant school is of enormous value as an agent in the formation of good habits. When children are admitted into a senior school straight from the street they come with bad habits already contracted, and it is almost hopeless to look for an abundant harvest of the good seed from a soil which is choked with weeds. Then, too, all the education which the children of the poor can get must be crowded into the period wherein they are too young to earn anything, and from so short a time the earlier years can ill be spared, especially as those are the years when the attention is most alert and the memory most retentive. It is strange that infant schools should be so entirely modern, but this is probably due to the fact that till recently the imparting of knowledge was considered to be the sole work of a teacher, and young children were believed to have small capacity for receiving knowledge.

History of English Infant Schools.—It is said that the first institution bearing even a rudimentary resemblance to the modern infant school was opened, about 1780, at Waldbach, in the Ban de la Roche, a mountainous canton in the north-east of France, by the pastor, J. F. Oberlin. He assembled all children between two and six living in the parish. Then he and Louise Scheppler showed them pictures and maps, talked to them, and taught them reading and sewing. Some years later Pestalozzi (*q.v.*) and de Fellenberg, though they did not establish infant schools, gave form and body to ideas which have helped to make infant schools what they are.

The first infant school in the United Kingdom, that at New Lanark, by the falls of Clyde, was not a copy of continental models, but an original, gradually evolved by the circumstances of the place. In 1783 David Dale (in company with Richard Arkwright) there set up one of the earliest cotton mills that Scotland had seen. Work at a factory was considered by the labouring classes an inferior and degrading occupation; 'hands' were consequently hard to get, and only those whose want of character made it difficult for them to obtain employ elsewhere resorted to the mills. The ply from this unsatisfactory source supplemented by a supply from an source equally unsatisfactory, the sup tendents of the parish poor, who furni a large number of young children the lowest quarters of populous to Mr. Dale belonged to the class of empl who do not think that they have discha all obligations when they have paid workmen's wages. Believing that it his duty to promote the moral and n rial welfare of those whose labour bro him wealth, he set up schools for younger hands and tried in various to benefit the older ones. His ef however, were only partially succes for, strong in the simple faith of evangelical fathers, he thought that restraints of religion ought to suffic all, and was baffled by men who w not submit to them.

When Dale retired from active li disposed of his business to a small pany of merchants and manufactu mostly English. The chief proprietor leading spirit was Dale's son-in-law, bert Owen, a philanthropist, who brought all the powers of a strong ingenious mind to the study of s questions, and had formed indepen conclusions respecting the solution of t Entirely agreeing with his father-in as to the duty of employers, he proce at once to put his theories into prac He believed that men are largely the tures of the circumstances in which are placed. Consequently he used e possible means at once to prevent w and to encourage right, while he appe to have an unconquerable faith in possible goodness of human nature.

Of his methods with adults this is the place to speak. The young were ta in hand betimes. The system of recei parish apprentices was abolished, and with large families were encourage settle in the neighbourhood, good ho being provided for them. The practic employing children of six, seven, and e in the factory was discontinued, and an cellent school was established. There at first no intention of providing speci for infants, but as no child that could was refused admission the school soon overrun with little ones too yo to profit by any mode of instruction t

in use. They might possibly have been sent home to be out of the way but for the happy accident of a teacher being found just fitted by nature to deal with them. This teacher was Mr. James Buchanan, who possessed the patience, tact, sympathy, and invention needful for overcoming the novel difficulties of the situation. He made the children thoroughly happy; he did not weary their little brains with books, yet he succeeded in instructing while he amused them with pictures and objects.

In June 1816, Mr. Owen, describing the schools as they then were to a Committee of the House of Commons, said:—'The children are received into a preparatory training school at the age of three, in which they are perpetually superintended to prevent them acquiring bad habits, to give them good ones, and to form their dispositions to mutual kindness and a sincere desire to contribute all in their power to benefit each other. These effects are chiefly accomplished by example and practice, precept being found of little use and not comprehended by them at this early age. The children are taught also whatever may be supposed useful that they can understand; and this instruction is combined with as much amusement as is found to be requisite for their health, and to render them active, cheerful and happy, fond of the school and of their instructors. The school in bad weather is held in apartments properly arranged for the purpose, but in fine weather the children are much out of doors, that they may have the benefit of sufficient exercise in the open air. In this training school the children remain two or three years, according to their bodily strength and mental capacity. When they have attained as much strength and instruction as to enable them to unite, without creating confusion, with the youngest classes in the superior school, they are admitted into it, and in this school they are taught to read, write, account, and the girls, in addition, to sew.'

As the fame of the reforms accomplished in New Lanark spread, thousands of tourists visited the place, and the more enlightened went away desirous of copying elsewhere some at least of Mr. Owen's plans. Thus Brougham, Lord Lansdowne, John Smith, James Mill, Joseph Wilson, and others, in 1818, opened an 'asylum for infancy' in Brewer's Green, afterwards removed to Vincent Square, Westminster, and borrowed James Buchanan to conduct it. In London Buchanan made the acquaintance of Samuel Wilderspin, then clerk of the New Jerusalem Church, Waterloo Road, to whom he taught his methods of dealing with young children. Seeing the success of the Westminster school, Mr. Wilson, in 1820, opened one in Spitalfields, and on the recommendation of Buchanan gave the charge of it to Wilderspin. When the new master, accompanied by his wife, appeared on the scene of his labours, he found the room filled by a crowd of little boys and girls, running, laughing, and shouting. He tried to get silence, but his commands were not heeded, and indeed not heard. Each group that he quieted broke into disorder as soon as he left it. At last, almost in despair, he snatched off the bright cap which his wife was wearing and dangled it at the end of a pole. This aroused the curiosity and arrested the attention of the young mob, and the battle was won.

By altering Buchanan's methods a little (sometimes for the better and sometimes for the worse), and by drawing a distinction between infant asylums and infant schools, Wilderspin persuaded himself that he was the founder of the latter, and, what is more to the purpose, he persuaded the Prime Minister, and got placed upon the civil list. Wilderspin was never skilful in the organisation of a school, but he was a good gallery teacher and a good missionary. The zeal and activity which he displayed in promoting the establishment of infant schools brought him into notice, and he was made superintendent of the Dublin model schools of the Irish Commissioners. His attainments, however, were too humble for him to retain the post. He deserved his pension, not because he was the original founder of infant schools, but because he was an earnest and successful advocate of them.

While one set of circumstances was working out one solution of the problem of early education at New Lanark, another set of circumstances was working out another solution a few miles down the Clyde. David Stow, the son of a merchant, was born at Paisley on May 17, 1793. He was educated in the grammar school of

his native town, and at the age of eighteen entered the service of a Glasgow firm. 'For five years previous to 1819' he was charged with the distribution of certain funds to poor old men. His charitable mission led him through the Saltmarket (the 'St. Giles' of Glasgow), and his eyes and ears were often shocked by the profanity, indecency, and vice which were exhibited by children and even infants. The only remedy which suggested itself to him was a Sunday school, 'for I then,' he says, 'participated in the almost universal delusion that religious instruction would accomplish all, and I had not learned that religious and moral *instruction* and religious and moral *training* are two distinct things.' He set up his school in a kitchen in a low lane, and only admitted children living in that lane or the next, thus removing the aversion they might have to appearing in rags among strangers. The idea was considered so good that from 1817 to 1824 schools for about nine thousand children were established on the 'local system' in various parts of the city. Stow and his fellow-workers, however, gradually discovered that one day's teaching in school was not equal to six days' training in the streets. The opening of a weekday school followed naturally. '"Prevention is better than cure" was our motto,' says Mr. Stow, 'and to begin well we cannot begin too early. My first object, therefore, was to begin with children under six years of age, before their intellectual and moral habits were fully formed, consequently when fewer obstacles were presented to the formation of good ones.' The promoters were fortunate in securing for their first school a born teacher of infants, Mr. David Caughie. Other schools for infants and for older children followed, and in 1827 the Glasgow Normal Seminary was formed. Here Stow's 'training system' was fully developed and exhibited, and here persons came to learn it. The essence of this system lay in the distinction drawn between *teaching* and *training*. 'Teaching is simply telling, and when not united with training is weak, because it stands alone; when conjoined, however, the effect is powerful and strikingly manifest.' In other words, Stow maintained that the end of education is the cultivation of good habits, and it was because the cultivation of good habits cannot begin too early that he first open infant schools. 'Infant teaching schoo without a playground' he considered 'd cidedly injurious to the health of bo and mind, and even with a playground, the stuffing system' was pursued, th 'ought to be condemned.' No one w deny that the formation of character a the acquisition of knowledge are *differen* the weakness of Stow's system lay in t assumption that they are to some exte *antagonistic*. Its strength lay in t prominence which, in morals, it gave action as distinct from rule—in enforci that 'the only way to do a thing is ju to do it.'

While the Glasgow merchant w working out one system of education the dirt and squalor of a great industri capital, an English clergyman was exem plifying another system in the rural qui of a Surrey village. The Rev. Charl Mayo, D.D., was one of the many visito to Yverdun whose enthusiasm was ki dled by the enthusiasm of Pestaloz 'Profoundly convinced,' he says, 'of t truth of Pestalozzi's views, and warne against his errors by long actual observ tion of their consequences,' he 'determine to attempt the introduction of his meth into England, religiously preserving t *idea*, but adapting the *form* to those ci cumstances in which he might be place He considered that the most effectu mode of accomplishing this end was to d vote himself to the formation and condu of a school in which the arrangement an practical application of those principl might be made. To exhibit the syste in operation, to elaborate, by means experiments continually repeated, a cours of instruction, and above all to prepa materials for an appeal to actual result seemed to him a far more useful an effectual, though less rapid or brilliant process than that of dragging it before re luctant audiences at public meetings, of advocating its merits in the periodica publications of the day. He was conten that it should be buried in oblivion for while, assured that if it possessed the lif of truth it would in due time spring u with renovated vigour.' Aided by Mis Mayo, his sister, he set up a school a Cheam for the children of the upp classes, and thence from time to tim issued little books of 'Lessons' on th method of the master. The interest whic

Mr. John Stuckey Reynolds felt in the establishment of infant schools brought him into contact with the Mayos, and in conjunction with them he conceived the idea of applying the principles of Pestalozzi to the schools of the poor. The result was the establishment in 1836 of the Home and Colonial School Society (*q.v.*), for the purpose of supplying infant school teachers.

There were already existing some infant schools in connection with the British and Foreign School Society (*q.v.*), and the attention which, from so many points, was being directed to their importance led to a rapid increase in their number. In 1845 Mr. Joseph Fletcher, one of the first inspectors appointed by the Committee of Council, was instructed to report upon them. Speaking of the earlier infant schools he says some of the promoters appeared to have considered them merely as asylums for healthful amusement under some degree of discipline and control Others, thinking that they presented opportunities likewise for mental development, introduced some of the plans of Lancaster and Bell, never calculated for infants. Others again made oral instruction from the Scriptures a part of their plan, but as hardly any faculty, except the memory, was exercised, and as that was exercised almost exclusively upon words, they grievously failed. 'The most fatal error was, however,' says Mr. Fletcher, 'the leaven of intellectual display which, whatever the subjects for its exercise, appears to have crept into a good many of these establishments of earlier foundation. It seems to have produced in some of them what I do not know how to designate otherwise than as the "prodigy system," under which the quicker children were to be wonders of envy and admiration to the rest, and the whole school in which they were exhibited one of admiration, if not of envy, to its friends and neighbours. . . . Conceit, envy, and fretfulness, ill restrained by fear, were the leading moral elements of such a system, and stultifying verbal repetition its chief intellectual exercise.'

By the time of Mr. Fletcher's report, however, a great improvement had been wrought, and schools of the kind which he described but to condemn were fast disappearing. The theory of all the modern schools which he had visited appeared to contemplate an education at once physical, intellectual, industrial, moral, and religious; and the largest part of the work undertaken by the best of them was the implanting of good habits of body, heart, and mind, which should grow with the growth and strengthen with the strength of the little ones. The children were generally divided into two classes, according to their age. Those in the younger class were taught by a series of contrivances to talk and to look at pictures with intelligence, and also to go through a variety of simple movements in marching and changing stations at brief intervals. They were also taught their letters, and exercised in forming elementary syllables. As they grew out of the earlier stage they passed into the higher division, where they received, according to their capacity, somewhat more varied instruction. The teacher told them stories about the animals and other objects represented in the pictures, and about persons and events mentioned in the Bible. They were also exercised in plaiting, tying knots, sewing, and other manual occupations, and they were instructed in the elementary rules of arithmetic, principally by means of physical illustrations of them. The elder pupils could read the New Testament, write in a copy-book, and work questions in the first four rules of arithmetic. Such pupils ought strictly to have been in a senior school, but the infant school was often the only one which poor children attended. On leaving that they went to work. Though, compared with the best infant schools of the present day, the best schools visited by Mr. Fletcher would appear to be formal, and their exercises to be marked by an insufficient knowledge of child nature, it cannot be denied that enormous progress had been made.

This progress was maintained. The Royal Commission of 1858–1861 (generally named after its chairman, the Duke of Newcastle) explicitly declares that in the best infant schools much was done and much even taught. The Commissioners further declared that infant schools 'form a most important part of the machinery required for a national system of education, inasmuch as they lay the foundation in some degree of knowledge, and in a still greater degree of habits which are essential to education, while without them a child may contract habits and sustain

injuries which the best school will afterwards be unable to correct and remedy.' Infant schools possessed the advantage of being 'comparatively cheap, as they are usually taught by mistresses.' Further, the 'religious difficulty could hardly arise in them, it being scarcely conceivable that the instruction of children under seven years of age should ever be dogmatic.' The Commissioners, however, beyond suggesting that every schoolmistress should undergo a course of training to adapt her to deal with infants, made no important recommendation on the subject. Under the various Codes (*see* GRANTS), infant schools steadily increased in number, but there was no material change in the work which they did till the methods of Fröbel (*q.v.*) began to be practised in them. In 1874 the School Board for London appointed its first lecturer on the Kindergarten, and other important School Boards soon followed the example thus set. Their action, aided by the action of the Fröbel Society and of kindred associations, and of the Home and Colonial School Society, of the college at Stockwell, and, later on, of the college at Saffron Walden, spread a knowledge of the new system among infant-school teachers generally. At first, as was natural, there was too slavish an adherence to the mere methods of the master; but gradually it was discovered that in the domain of education, as elsewhere, the letter killeth, and now in many a school where Fröbel's cubes and balls are never seen, the whole work is brightened and vivified by his spirit. The reformation has been greatly helped by a change in the Code giving absolute liberty of classification in infant schools, and (practically) abolishing therein the system of 'payment by results.' In the Blue Book of the Education Department for 1888, the inspectors unanimously testify to the improvement which has taken place. One says that the 'appropriate and varied occupations' which have been introduced are 'popular with the parents and attractive to the children, and that elementary subjects have not suffered in consequence.' Another says that object lessons 'have become more definite, varied, and graphic.' Another says: 'The manual exercises in which the children are trained furnish an interesting and delightful diversion from the ordinary school work, and at the same time educate hand, eye, and mind. Drawing, embroidery, weaving, moulding in clay, if pro taught, are invaluable instrument developing at once the mental and p cal faculties. And in view of our departure in the direction of tech education they should be cultivate part of its best foundation. . . songs and games, too, have a very br ening, civilising effect. . . . I only we could continue in the first and se standards the same training. But, the children who leave the infant sc for the older departments part, I it must be said for ever, with all special advantages. . . . Could n change in the principle of the payme grants to such schools be made w would have the effect of assimilating to the infant schools?' Similar ext might be multiplied indefinitely.

Infant Schools and the Code.—By Code now (1888) in force a fixed g is paid of 9*s.* on every child in ave attendance in an infant school. A n grant of 2*s.*, 4*s.*, or 6*s.* is further pa the inspector reports the school to be good, or excellent, 'allowing for the sp circumstances of the case, and having gard to the provision made for (1) suit instruction in the elementary subj (2) simple lessons on objects, and on phenomena of nature and of common and (3) appropriate and varied occ tions.' Further grants of a shilling are paid for needlework and singing. merit grant is paid if the instructio the 'elementary subjects' is not satis tory. In the official 'Instructions' inspectors are informed that 'the ob of examining very young children in t subjects is to ascertain whether they making such progress that there reasonable prospect of their passing examination when they reach the [f standard.' They are further infor that in order to satisfy the requiren respecting 'simple lessons in objects,' the mistress early in the school should draw up and enter in the Book (*q.v.*) a course of thirty or forty lective lessons—*e.g.* on animals; on subjects as coal, glass, and salt; common employments, as paper-mak cotton-mill, house-building, one of trades of the district being chosen in ference; on form and colour, food, pl and clothing; on simple facts in nat

as rain, frost, the seasons; on familiar scenes in common life, as the Post Office, a shop, a railway, washing, or harvest. Each of these should in the course of the year be given two or three times.'

'The manual or other employments which best satisfy' the requirements as to 'appropriate and varied occupations' are 'modelling, simple geometrical drawing, weaving, plaiting, building with cubes, drill, singing, recitation, and other exercises, such as will relieve the younger children, especially during the afternoon, from the strain of ordinary lessons, and train them to observe and imitate. It should be borne in mind that it is of little service to adopt the gifts and mechanical occupations of the Kindergarten unless they are so used as to furnish real training in accuracy of hand and eye, in intelligence, and in obedience.'

Statistics. — According to the Blue Book the Education Department issued in 1888, there were 6,698 infant schools in England and Wales in 1887, and, in addition, 5,173 classes for infants in senior schools. The number of children in average attendance at schools and classes was 1,034,314.

Some Foreign Infant School Systems. — The French pride themselves upon the fact that the care and education of young children are more thoroughly organised in their country than in any other. The lowest part of their system is the *crèche*, which provides for babies up to two or three years of age. Then comes what used to be called the *salle d'asile*, but what is now known as the *école maternelle*, which provides for infants from about two to six. Then comes the *école* or *classe enfantine*, for children of four or five up to seven or eight. Children who have passed through the infant school or class are transferred to the 'elementary class' of the primary school.

In Belgium the *école gardienne* receives children from three to six. Thence they are passed to the transition class, which may be either the highest class of the *école gardienne*, or the lowest of the primary school. The transition class must be under the care of a mistress familiar with the methods followed in both the infant and the primary schools.

In Switzerland there is no uniformity, each canton being a law unto itself. In Geneva, for example, it is compulsory on each commune to have at least one infant school; while in Neuchâtel public infant schools are permissive, and only the more enlightened municipalities have established them.

Z

Zerrenner, Charles Christopher (*b.* 1779, *d.* 1850), a German theologian and educationist, was born at Magdeburg. He became a professor in his native city, and afterwards preacher in the church of Saint Esprit. Zerenner was the author of the following among other works on education: *An Auxiliary Work on the Wisdom of Teachers* (1803), *A Book of Methods for the Use of Popular Educators* (1814), *The Principles of Scholarly Education* (1827).

Zoology as a School Subject.—Zoology is here to be discussed as a branch of natural history, which may be understood to embrace the study of all the particular aspects of nature that are most striking to the child's mind. These are chiefly phenomena of the universe, i.e. the facts treated of in physical geography; the structure and position of rocks (geology and mineralogy); the morphology, classification, and life-histories of plants (botany); and similar facts about animals (zoology). It is true that the term 'natural history' is sometimes used as synonymous with the last, and zoology as a specific science has now become merged in the more general science of biology. But we have not here to do with the study of animals as the most highly organised of living things; this is a subject for the most advanced students at the university, since plainly the most complex of Nature's productions require for their full explanation a preliminary study of the less complex; therefore zoology as a branch of biology should come after chemistry and physics; and since the last requires the mastery of some of the most difficult parts of mathematics, we are driven to the conclusion that zoology in *this* sense is not a school subject at all. The questions to ask then are: can

school? does it serve useful purposes? if so, *how* should we teach it, and *when*, in the school course? The answer to the first question will be clearly in the affirmative, if we remember that the objects and facts that we have enumerated may be looked upon in various aspects, and that their connections are of various degrees of complexity. The human race is only just emerging from its childhood, so far as its scientific knowledge is concerned at any rate, hence the facts and the modes of looking at them that have interested men at various periods will be interesting to the child at the various stages of his development. Although the question of the suitability of such subjects to the purposes of the schoolmaster, namely, the development of faculty, would seem next in importance, we may postpone the answer since it will be seen to grow out of the discussion of *method*. Firstly it is of the utmost importance that the teacher should make his instruction as concrete as possible; he should not begin with abstractions or generalisations, however well based on recent discovery and careful observation. The child's attention must be drawn to simple, everyday facts, which he must be made to study in detail; the skill of the teacher will be shown in the way in which he turns to account the most ordinary fact, in order to exhibit the relation of cause and effect, and to show the links which unite the fact under observation with others more or less analogous that have been already noticed. He must then help the pupil to form for himself generalisations that will embrace all that he has observed. A small number of facts well known under all their relations, whose nature, cause, and effects have been well understood, are of more value for the development of the intelligence than millions of facts over which the mind, as it were, glides, without being arrested by any of them; for, by the law of association of ideas, our minds retain well only the things of which we recognise the connecting links.

This method has been advocated and exemplified by our distinguished naturalist Huxley, in his two works *Physiography* and *The Crayfish*. In the latter book he shows, as he says in his preface, 'how the from the most vulgar notions to the largest generalisations, to the most difficult problems of zoology, and even to the science of biology in general.' Not that such a course as that proposed in *The Crayfish* would be exactly suited to any but the highest class in a secondary school. The confinement of the attention to a single animal would present too little variety to minds untrained to observation. Yet his principle may be applied at all stages of the school teaching, the unity may lie in the class of facts brought under notice, rather than in the object in which they are observed. As he says more explicitly in the introduction to his *Physiography*, 'It appears to me to be plainly dictated by common sense that the teacher . . should commence with the familiar facts of the scholar's daily experience; and that from the firm ground of such experience he should lead the beginner step by step to remoter objects and to the less readily comprehensible relations of things. In short, that the knowledge of the child should of set purpose be made to grow in the same manner as that of the human race has spontaneously grown.' It is indispensable to proceed from the known to the unknown; the first lessons will consist in guiding the pupils to recognise the facts of which the relations will be established later; it is for the teacher to make a judicious choice of facts among those that may present the largest number of relations, or that will awaken and retain the curiosity of the child. As Buffon says, 'Children are easily wearied of things that they have already seen, they will look at them a second time with indifference unless presented under some new aspect.' Again he says, 'Mystery at this age excites curiosity, whilst at a ripe age it inspires only disgust.' Let us apply these general considerations to the natural history of our junior classes. Where shall we begin—with animals, vegetables, or minerals? Assuredly with that which of itself solicits the child's interest. The animal, by its movements, by its spontaneity, by its diverse modes of walking, flying, eating, attacking, defending itself, presents such an attraction to the child that the playthings most appreciated are those which are most like animals. Even

fly. In the child's fifth or sixth year it is already possible to direct its attention to the parts of the body, to the manner in which they are employed for walking, eating, and other functions of life—and this in connection with the most common of our indigenous and domestic animals; thus the bat, the mouse, the spider, the frog, the cat, &c., furnish matter for the most interesting object lessons. The child will thus learn to observe attentively, to see exactly and quickly without strain or fatigue. From the first *drawing* should be encouraged, not necessarily of the whole animal, but of striking points. Thus even small children can attempt the owl's beak and the cat's claw. The teacher must of course himself be a keen observer, and must have at his command a store of anecdotes furnished by his own observation. He will thus be methodically cultivating another faculty of his pupils, of no less importance educationally, namely, their imagination. These lessons on animals may well be followed by similar ones on plants and minerals, but always of the same kind; the question to ask about a plant at this stage is not, 'to what class and order does it belong?' but 'what is it like? what are its parts? where does it grow best? when does it bloom? how long does it live?' &c. Later, we may return to our animals in order to apply more rigidly the methods of science, and from this point botany and zoology may be taught side by side, or alternated by short courses of geology and physical geography.

There comes a time to most children, usually at the age of twelve or later, when they have a mania for collecting. Seals, stamps, coins, &c., furnish material for gratifying this desire; but there is no reason why it should not be directed to natural objects, which not only keep up the interest of the previous instruction, but also prepare the way for a new stage, the classificatory. But the formation of these collections has other advantages than their direct bearing on the class lessons. The child is by this means brought into intimate relation with Nature, his physical development gains by the out-of-door walking, climbing, and even by the looking and watching involved, the teacher will no doubt occasionally accompany some of his class in their ramble, and, whilst sharing their search, will teach them valuable lessons on 'Eyes and no eyes, none the less valuable for being deprived of the formality of the class-room. On returning home the young collector arranges his objects, observes, tries to identify them; he thus learns the value of order and method both in his thoughts and actions. The great naturalist, Cuvier, has borne testimony to the value of the training in method furnished by scientific studies. He himself was a man of varied avocations, professor at the university, director of the museum, member and president of the council of state, &c. He says he would have found it difficult to perform the various duties involved, without the application of the method of which he speaks. 'The habit that is necessarily acquired in studying natural history, of classifying in one's mind a very great number of ideas, is one of the advantages of which little has been said, and which will become one of the most important, when the subject shall be generally introduced into common education. We by this means obtain practice in the part of logic called method, almost as much as one gets practice in the syllogism by the study of geometry.... Now this art of method when once mastered can be applied with infinite advantage to studies most foreign to natural history. Every discussion which supposes a classification of facts, every research which demands a distribution of material, is carried on according to the same laws; and the young man who thought he had been pursuing this science only as a source of amusement, is himself surprised at the faculty which it has developed in him for business of all kinds.' In order that such a result may be obtained, it is not necessary that large collections should be made. A hundred insects or plants carefully studied would suffice to develop this most valuable spirit of method.

The private collection will naturally give rise to a school collection or museum; fortunate possessors of rare objects will be glad to contribute or to lend them to it; sometimes whole collections of small objects, as eggs, insects, &c., will be lent for a period and compared with others; thus the *esprit de corps* of the school is fostered. As the teachers will of course inculcate respect for life, especially of the higher animals, they will encourage the children to bring specimens of birds and small mammals found dead, and will have

them stuffed to place in the museum. These will be of use for the class-lessons; even skeletons can often be found, or portions of them, especially in woods, and will be of use when the time comes for detailed study of anatomy.

At this stage much interest will be added to the study of geography by the description of the fauna and flora of distant lands, which the children will be in a position to compare with their own. It is impossible in fact to picture to oneself India without the elephant, Australia without its kangaroos, Madagascar without its lemurs. Good pictures will of course be needed for the leading types, and the teacher must read books of travel, with special attention to the descriptions of plants and animals. Now will come the time for lessons on classification, based on the resemblances observed in specimens actually handled and the pictures of foreign types. Nor can we avoid touching upon the relations of animals to man and his works. In primary schools it will be of no small advantage to the future agriculturist to overcome the many foolish prejudices that abound in rural districts, and the fear of harmless animals; to understand the true function of these friends of man, and the right way of checking the ravages of those that destroy his crops or decimate his herds. Not that these points need form the subject of formal lessons, but should arise naturally out of the teaching of zoology, and when once put upon the right track, the peasant will discover much for himself in the course of his daily experiences after school-days are over. To return to secondary schools, the zoology and other branches of natural history may be dropped for a time when the physical sciences are begun, to be resumed later when these have been pursued sufficiently to throw light upon the physiology and histology of plants and animals, and the causes of the phenomena described under physical geography.

At this stage good diagrams are essential; but if the teacher can draw there will be not much difficulty in providing these. A good microscope should be part of the school furniture, and opportunities may be found for exhibiting sections of tissues, cells, &c.; thus the diagrams of such things will be better understood and appreciated. The physiology of animals should lead up to the much-neglected study of human physiology, so impor as guiding to the laws of health.

It will be important to encourage foundation of clubs among the schol when these have been once started by co-operation and encouragement of teachers, they can be left to the man ment of the more enthusiastic pupils. the periodical meetings specimens wi brought and short papers read; min should be kept; and the teacher may s his interest by occasionally taking chair and reading them. It is well to up several clubs, as matters that inte the younger children will not be so in esting to the elder, and *vice versâ*. Poss two classes might combine with advant especially if studying different branch natural history in the class-room. To up then, by briefly answering the quest with which we set out: 1. Zoology branch of history *can* be taught in sch of every grade. 2. The purposes it se are manifold. It develops the ch powers of observation and of compari leads to methodical arrangement of id promotes accuracy both of thought word, arouses interest in nature, furni a motive for the out-of-door exercis good for mind and body, encourages *es de corps* among the scholars by gi them intellectual pursuits in common of the class-room, and opportunities assisting one another to gain knowle 3. It must be taught in such a man that these purposes may be fulfilled to utmost, in the first years of school object-lessons, by directing attention habits, characters, utility of animals, by couragement to form collections, drawi to note down observations in writing be read at the 'club'; later by more s tematic lessons on the relations of fo and functions, to which analogies will furnished by the study of plants a fossils brought up to the same sta 4. The time when it should be taught also been indicated, namely, in the form object lessons in the lowest class, a alternately with other branches of natu history and the physical sciences throu out the school course.

In English secondary schools the s ject does not usually receive the attent it deserves. In elementary schools it scarcely recognised, even among the ' tional' subjects. In France, howev natural history is among the subjects t

were made obligatory by the law of 1882, and the programme issued is so suggestive that we reproduce it in full. The place occupied by zoology and its relation to the other branches will be readily seen.

Infant Class. Little 'lessons on things' (object-lessons), always with the object under the eyes, and in the hands of the children. Exercises and familiar conversations, having for their object to enable the children to acquire the first elements of knowledge concerning animals, vegetables, minerals, and above all to lead them to look, to observe, to compare, to question, and to remember.

Elementary Course.—Object lessons: graduated according to a plan chosen by the master; but, once chosen, it must be followed regularly. Man, animals, vegetables, minerals. General notions about the conversion of raw materials into artificial substances in common use (foods, tissues, paper, stones, metals). Little collections made by the pupils, especially in the course of school expeditions.

Middle Course.—Very elementary notions of the natural sciences. Man: General description of the human body; the idea of the principal functions of life. Animals: Notions of the four sub-kingdoms, and of the division of the vertebrates into classes, by the aid of an animal taken as the type of each group. Vegetables: Study, on certain selected types, of the principal organs of the plant. Notions about the large divisions of the vegetable kingdom, indications of useful and poisonous plants, especially in the school expeditions.

Higher Course.—Notions about the natural sciences. Revision with extension of the middle course.

Man: Ideas about digestion, circulation, respiration, the nervous system, the sense-organs. Practical advice in matters of hygiene.

Animals: Broad features of classification. Animals useful and noxious to agriculture.

Vegetables: Essential parts of the plant. Dried collections.

Minerals: General notions about the earth's crust. Rocks, fossils, soils. Examples drawn from the district. Excursions and small collections.

In the normal schools a more strictly scientific course is prescribed for each of the three years of training. Germany, Switzerland, Norway, and Belgium also render the subject obligatory, but in the primary schools the knowledge is generally left to be obtained from the reading-book, a method that by no means serves all the purposes we have indicated. In the United States the teaching is methodical, and on the lines we have seen laid down in France.

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Vide also § II. (*b*): Universities.

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Cf. Leitch *and* Quick *in* II. (*a*)

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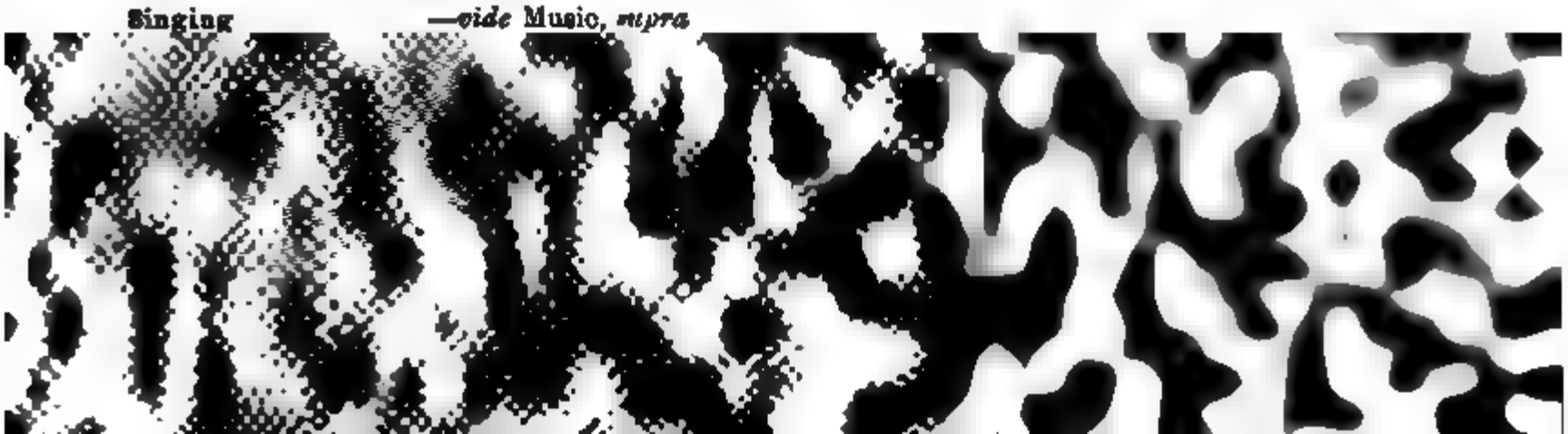

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